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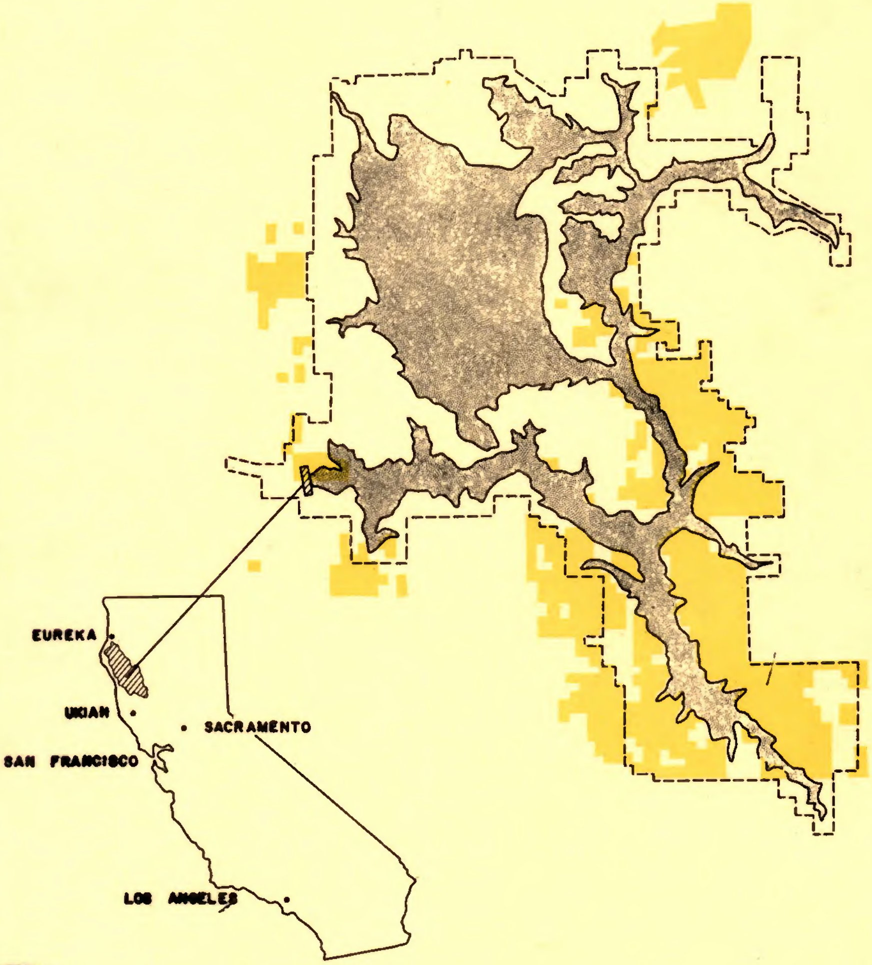
PRELIMINARY

IMPACT STUDY REPORT

for the proposed

DOS RIOS PROJECT



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Dos Rios Project

November 1, 1968

Colonel Frank C. Boerger
District Engineer
Corps of Engineers, San Francisco District
100 McAllister Street
San Francisco, California 94102

Dear Colonel Boerger:

Enclosed for your consideration are ten copies of our preliminary impact report for the proposed Dos Rios Project, Middle Fork Eel River, California. We will welcome your comments concerning this preliminary report, by December 30, 1968, if possible. We have forwarded additional copies to other appropriate Federal and State agencies asking for their review and comments prior to completion of our final impact report.

The Dos Rios Project, if authorized, could be completed by 1980. It would create one of the largest fresh water impoundments in the United States, about 7.6 million acre feet covering about 40,000 surface acres. In addition, there would be about 66,000 acres of land within the project boundary above the reservoir flow line. BLM administers 18,235 acres of this total.

The proposed Dos Rios Reservoir lies within BLM's Mendocino Resource Area, one of three Resource Areas under the administration of our District Office at Ukiah. On December 14, 1967, after full public hearings and publication in the Federal Register, all of the lands in the vicinity of the Dos Rios Project were classified for retention in Federal ownership and multiple use management.

The Bureau of Reclamation proposed English Ridge Project, located only five miles south of the proposed Dos Rios Project, is also in the Mendocino Resource Area. BLM lands in this project area were also classified for retention on December 14, 1967. In the interim report for this project area, recreation and fish and wildlife enhancement are determined to be an appropriate Federal responsibility under BLM administration.

In the State of California, BLM maintains six district offices with exclusive jurisdiction over approximately 16 million acres. BLM manages these lands and resources for multiple purposes including watershed protection, outdoor recreation, fish and wildlife habitat, wilderness protection, timber production, livestock forage, and minerals production.

Accordingly, if all or a part of the recreation and fish and wildlife enhancement features of the Dos Rios Project are determined to be suitable for Federal administration in accordance with the Federal Water Project Recreation Act, P.L. 89-72, BLM appears to be the most appropriate Federal agency for administration. Except for Indian lands, National Forest lands, and the townsite of Covelo, BLM is prepared to assume the full land and resource management responsibility for all of the public domain and acquired lands within the proposed project area not occupied by the dam, reservoir, fish hatchery, and other facilities directly related to water storage features of the project subject to availability of adequate appropriations and manpower. The assumption of management responsibilities would also be contigent upon entering into necessary operating agreements with other agencies involved in the project.

One aspect of the proposed project that we recommend receive more attention in your interim report is watershed management. The Middle Fork Eel River is one of the most sediment laden streams in the United States. This is due in part to the highly erodible nature of some of the watershed soils. These soils, both within the project area and upstream, must receive special attention during project construction and subsequent thereto if further acceleration of sediment production and massive land slumps are to be avoided.

We also recommend that adequate road access and recreation facilities on the south side of the project, including the Elk Creek arm, be constructed initially as part of the project. We also suggest that the public interest would best be served by providing for a road and corridor of land joining the Dos Rios and English Ridge Projects.

Sincerely

Penny

J. R. Penny
State Director

Distribution: (following page)

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PROJECT

Dos Rios Reservoir

Corps of Engineers, Department of the Army

A Preliminary Impact Study Report for the Proposed Dos Rios Project Eel River Division North Coast Project

BUREAU OF LAND MANAGEMENT

California State Office, Ukiah District
Mendocino Resource Area

October 1968

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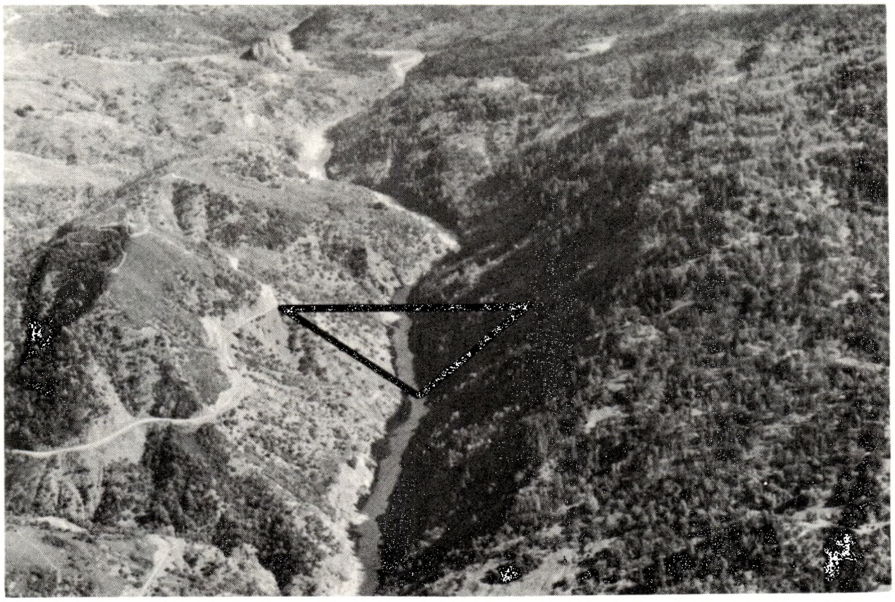

DOS RIOS DAMSITE
(Looking up Middle Fork Eel River)

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INTRODUCTION

The purpose of the report is to show the impact that construction of the proposed Dos Rios Dam and Reservoir would have on the management of Bureau of Land Management administered lands, resources and programs and the impact that BLM programs could have on the proposed project. The report also makes recommendations about management practices which are designed to minimize the adverse effects of the project.

BLM Authority and Responsibilities

Management of public lands administered by the Bureau of Land Management is in accordance with the various public lands laws including the Classification & Multiple Use Act of September 19, 1964 (P.L. 88-607), 78 Stat. 986; O&C Act of August 28, 1937, 50 Stat. 874; Taylor Grazing Act of June 28, 1934, 48 Stat. 1269, as amended,and the Federal Water Project Recreation Act of July 9, 1965. Authority for BLM management of recreational resources on Federal water projects is clarified and confirmed in a decision from the Associate Solicitor of the Department of the Interior, dated June 7, 1968. Under these laws, BLM is responsible for management of the total resources of the land, including watershed protection, outdoor recreation, fish and wildlife habitat, wilderness preservation, scenic and aesthetic values, timber production, minerals production, occupancy and urban expansion, and the preservation of public values that would be lost if the land passed from Federal ownership. Pursuant to the above responsibilities and the Classification & Multiple

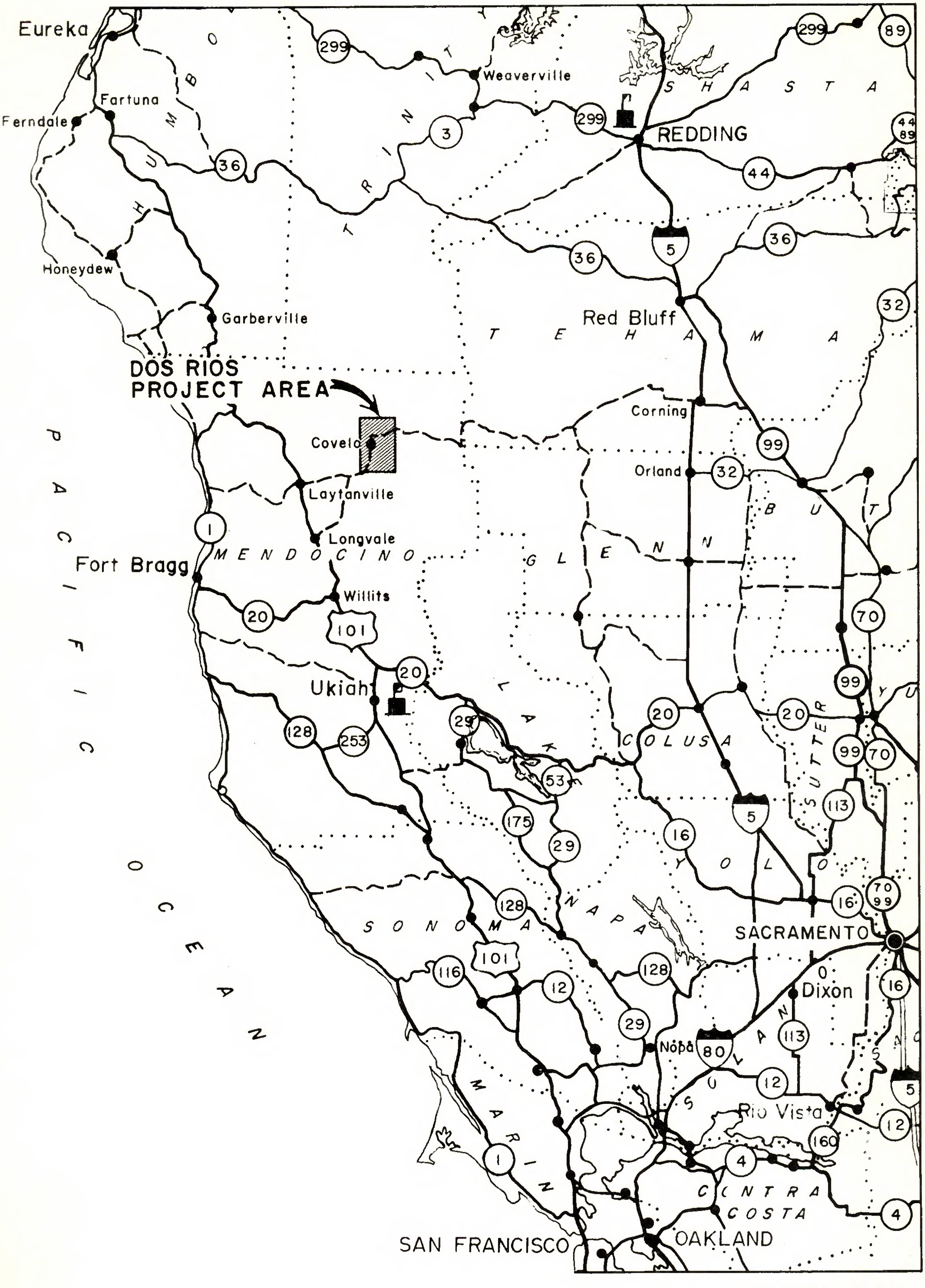
Use Act of 1964, the lands within the proposed project and all adjoining public domain were classified for retention in Federal ownership on December 14, 1967.

Location of the Project

The proposed project lies in northwestern California, 160 miles north of San Francisco and 10 miles east of Laytonville. It is reached by travelling on U.S. 101 to the Longvale Junction, then turning east on State Highway 261 for approximately 20 miles. Illustration No. 1 shows the general location of the proposed reservoir. Map No. 1 shows the location of the project in relation to the proposed Bureau of Reclamation-English Ridge Project and Willits, California, the nearest town of any size. Photograph No. 1 shows the proposed Dos Rios Dam Site.

Description of the Project

The proposed Dos Rios Dam is to be a 730 foot high earth and rock fill structure constructed by the U.S. Corps of Engineers on the Middle Fork of the Eel River within the north coastal area of California. Construction of the proposed dam and reservoir would be an early step in the California Department of Water Resources' plan of development for streams in northern California. The Dos Rios Reservoir is planned as a multi-purpose project including flood control, conservation and storage of water primarily for export to the Central Valley of California, hydroelectric power, recreation



VICINITY MAP

and the conservation and enhancement of fish and wildlife. When filled, an impoundment of 7.6 million acre feet of water would cover a surface area of 40,400 acres, and create 200 miles of shoreline at an elevation of 1603 feet above sea level. BLM administered lands that would be affected by the proposed project are generally located along the south and east edges of the proposed impoundment.

Estimated scheduling of completion of the dam and reservoir according to the Corps of Engineers' latest plans is as follows:

Proposed Authorization by Congress	1969 (Flood Control Act)
Advance Design	1970
Start Dam Construction	1973
Complete Dam Construction and other Facilities	1980
Fill Reservoir to Minimum Pool (Dead storage, 2 million acre feet)	1983
Fill Reservoir to Export Level	1985
Estimated Water Export (annual yield)	900,000 acre feet
Estimated Time for Filling Reservoir to Maximum Pool @ 1603' elevation (7.6 million acre feet)	8-10 years
Water Supply Pool (Maximum) (Top of Water Supply Pool 1587'el)	5,000,000 acre feet
Flood Control Reservation	600,000 acre feet

Approximate draw-down during the recreation season is expected to average from 20 to 30 feet. However, during extended drought periods the draw-down could be much more severe.

Climate

Climate in the Round Valley area is characterized by warm, dry summers (90°F) and cool, wet winters (35°F). Temperature extremes range from 12°F to 108°F, but the long term annual average is a moderate 56 degrees.

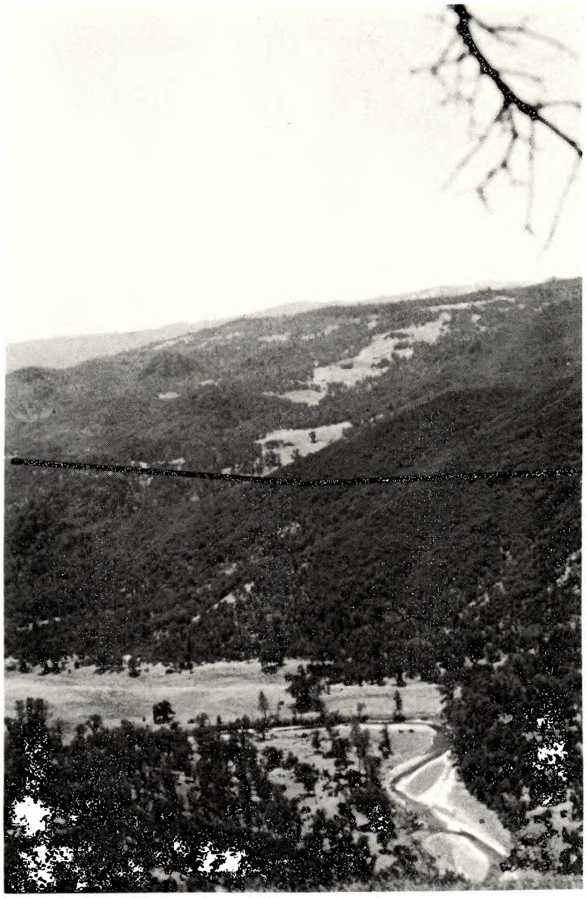
Precipitation ranges from 36 to 60 inches annually with an estimated average of 56 inches on the BLM portion of the watershed. Most of the moisture falls from October through April in the form of rain at lower elevations and snow in the upper watershed reaches. Precipitation intensities range from .70 inch per hour to occasional storms producing as much as 1.65 inches per hour. Approximately half the precipitation has been measured as surface runoff.

Vegetation

Vegetation on the BLM lands consists of the following types:

75%	Chaparral (composed chiefly of chamise and ceanothus)
8%	Oak grass
5%	Commercial timber (Douglas fir, white fir, ponderosa pine and Jeffrey pine)
12%	Non-commercial timber (Sargent and McNab cypress)

Interspersed among the above vegetal types and situated in drainage bottoms and canyons are thickets of a large variety of shrub and tree species including barberry, toyon, liveoak, digger pine, madrone and poison oak.



Elk Creek drainage showing
approximate high pool elevation

SUMMARY OF PROJECT EFFECTS ON BLM PROGRAMS

Approximately 38,637 acres of BLM administered land would be affected by the project. Public domain acreage within the proposed project totals 23,215.53. Of this total, 4,980 acres would be inundated. Administrative vehicle access to Elk Creek-Eden Valley area would be eliminated. BLM roads, rights-of-way and easements also would be affected. New approaches would be necessary for those roads partially flooded. Validity determination would be needed on unpatented mining claims. Inundated or destroyed survey corners would have to be replaced. Increased fire protection of the surrounding BLM lands would be imperative. Segregative land classification actions on public lands would be needed to recognize new recreation values. Coordinated land and resource planning and development would be essential. Highly erodable soils in the area would require special measures to protect watershed values. Special harvesting methods would be necessary for all timber within the watershed.

II. EFFECTS OF PROPOSED PROJECT ON BLM LANDS, RESOURCES AND PROGRAMS AND THE EFFECTS OF BLM'S RESOURCES AND PROGRAMS ON THE PROJECT

A. LANDS

BLM Lands

Out of 106,000 acres within the proposed project boundary, 23,215 acres are public domain. Of this, 820.74 acres are covered by seven withdrawals.

About 80% of the public domain is located along the Elk Creek arm and along the main stem of the Middle Fork Eel River to the southern end of Etsel Flat. BLM manages about 65% of the proposed shoreline in the Elk Creek area and about 75% of the proposed east shoreline from the mouth of Elk Creek north to the southern end of Etsel Flat.

Tabulation of Public Domain Affected by the Project

Total Inundated	4,980 acres
Total Within Project Not Inundated	18,235 acres
Total Within Project	23,215 acres
Total Outside Project	15,422 acres
GRAND TOTAL	38,637 acres

All BLM lands within the watershed are considered affected by the project. The expected effects on these lands are discussed in the following sections.

Classification

The proposed project is within the Ukiah District's East Mendocino Planning Unit. In accordance with the Classification & Multiple Use Act of 1964 (P.L. 88-607) the public domain lands within the proposed project were classified for retention and multiple use management and were segregated from appropriation under the agricultural land laws (43 U.S.C., Chapters 7 and 9; 25 U.S.C. Section 334) and from public sale under Section 2455 of the Revised Statutes (43 U.S.C., Chapter 2). Certain lands in Township 21 North, Ranges 11 and 12 West, M.D.M., within the project also were segregated from appropriation under the mining laws (30 U.S.C., Chapter 2). The classification was effected on December 14, 1967, and received support from local residents, property owners, conservation groups and public agencies. Map No. 2 shows the lands that were classified.

Other Existing Restrictions

Nine special land use permits have been issued on the subject lands, the majority of which have been to the California Department of Water Resources and the Corps of Engineers for project geophysical investigations. None of these permits will interfere with the project. All privately owned lands in the Round Valley area are zoned by the county as general agricultural (A-1). This is a broad zoning which permits all uses not otherwise prohibited by law.

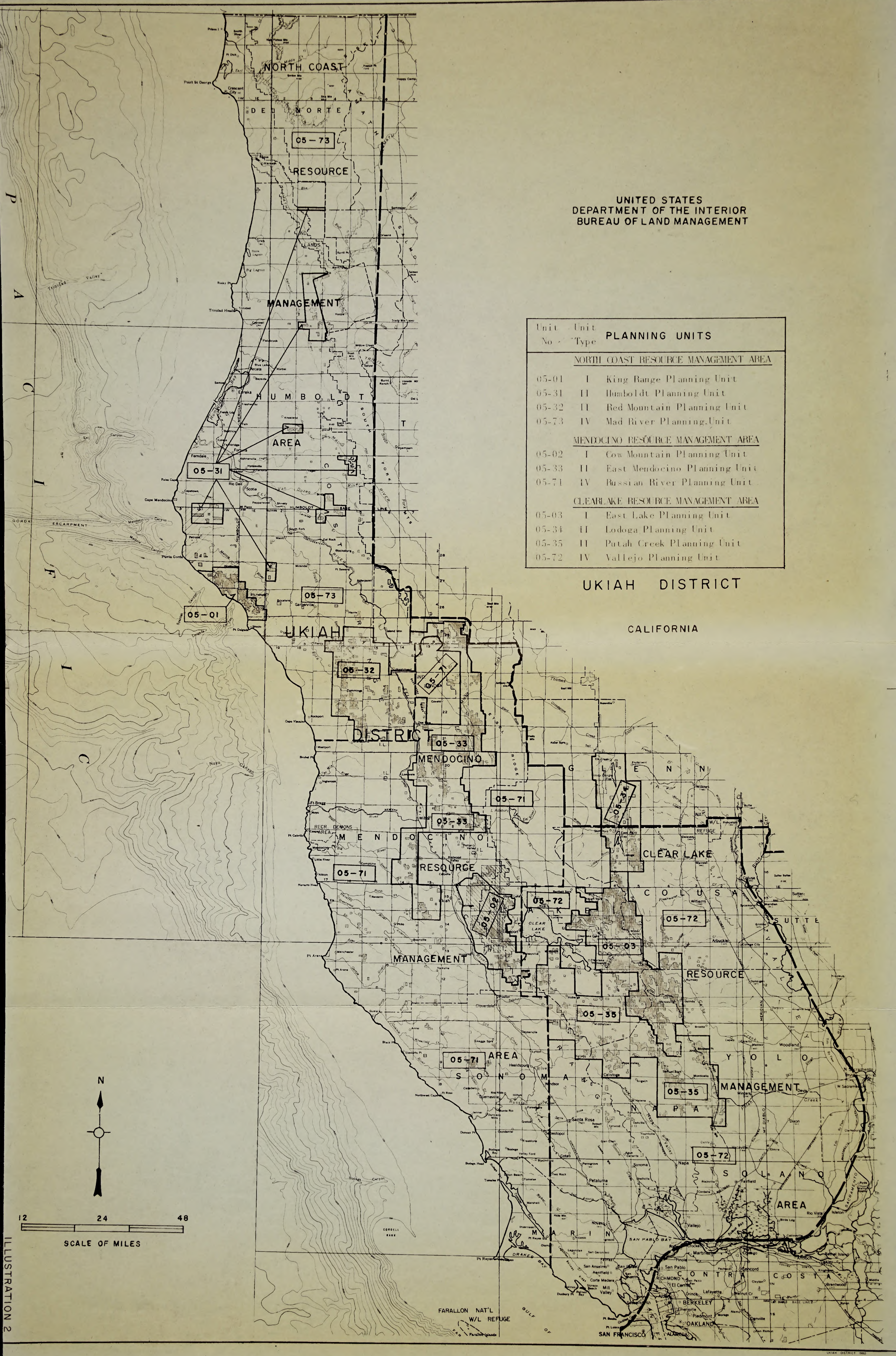
Other Lands

The State of California owns 640 acres and the County of Mendocino owns one small parcel of less than one acre. The Round Valley Indian Reservation has 5,445 acres and the Mendocino National Forest has 3,290 acres within the proposed project. The remaining acreage is privately owned. The impact that the proposed project will have on other public domain lands in the Ukiah District is difficult to determine. It is certain, however, that the creation of a reservoir of the size proposed would draw many people into the north coast area of California. While initial impact would be on the public domain lands within the proposed project area, the other Federal lands (BLM, U.S. Forest Service, National Park Service, etc.) within the general area would feel spillover effects from the project.

Illustration No. 2 shows the location of BLM's other lands within the north coast area of California.

Lands to be Acquired

Inasmuch as the existing private lands within the proposed project will be purchased in "fee simple" by the Corps of Engineers, it is BLM's opinion that lands surplus to the needs of the Corps of Engineers for actual operation of the reservoir should be managed for their multiple resources along with the public domain lands. Management of such acquired lands by BLM



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Unit No.	Unit Type	PLANNING UNITS
		NORTH COAST RESOURCE MANAGEMENT AREA
05-01	I	King Range Planning Unit
05-31	II	Humboldt Planning Unit
05-32	II	Red Mountain Planning Unit
05-73	IV	Mad River Planning Unit
		MENDOCINO RESOURCE MANAGEMENT AREA
05-02	I	Cow Mountain Planning Unit
05-33	II	East Mendocino Planning Unit
05-71	IV	Russian River Planning Unit
		CLEARLAKE RESOURCE MANAGEMENT AREA
05-03	I	East Lake Planning Unit
05-34	II	Lodoga Planning Unit
05-35	II	Putah Creek Planning Unit
05-72	IV	Vallejo Planning Unit

UKIAH DISTRICT

CALIFORNIA

UKIAH DISTRICT 1960

ILLUSTRATION 2

could be arranged by execution of a memorandum of understanding between the Secretary of the Army and the Secretary of the Interior in accordance with Section 7(b), Act of July 9, 1965, P.L. 89-72. The Department of the Army would retain in any transfer of land the rights of use necessary for unrestricted operation and maintenance of the water resource project. The Department of the Interior would acquire the rights of use and access needed for multiple use management purposes.

B. WATERSHED

The Eel River with its tributaries is among the highest sediment producing streams in the United States. This is due to the combination of steep topography, type of vegetation, character of soils and occurrence and intensity of precipitation. For this reason, watershed considerations are of primary importance. Construction of the proposed project would result in soil and vegetal disturbance through construction of roads and recreation sites which would add to the hazard of increased erosion and sedimentation.

Soil and Geology

There are six major soil types within the Dos Rios Reservoir area, all of which are developed from the Galice and Franciscan geologic formations. Overall, the soil developed on these geologic formations is very susceptible to natural slumps and sliding. Map No. 3 shows the soil distribution. Table 1 on the following page summarizes the major soil types within the study area. Experiment station studies and past experience with these soils have shown that road building, logging, fires, or any other kind of disturbance on soils derived from the above parent rocks will induce landslides, slumping and severe gully erosion. Generally, the ultramafic and serpentinized rock areas are the most unstable soils and very susceptible to landslides, slumps and erosion.

TABLE 1

Soils	Surface Texture	Depth to Bedrock	Reaction Ph	Parent Rock	Hydrologic Soil Group 1/	H2O Holding Capacity (in.)	Subsoil Permeability	Stability for Roads 2/	Susceptibility to Erosion	Suitable for Seeding	Fertility	Bearing Capacity
Yorkville	Clay Loam	10-20"	Slightly Acid	Altered Sedimentary	D	High 4-9	Slow	Unstable	Extremely Severe	Poor	Low	Low
Henneke	Loam	9-19"	Neutral	Serpentine	D	Very Low 1-3	Mod. Slow	Unstable	Severe	Poor	Very Low	Low
Montara	Clay Loam	6-15"	Mod. Alkaline	Serpentine	D	Very Low	Slow	Unstable	Slight	Poor	Very Low	Low
Hugo	Sandy Loam	60"+	Strongly Acid	Sandstone	B	High 4-11	Mod. Rapid	Stable	Severe	Good	Mod.	High
Laughlin	Sandy	15-30"	Mod. Acid	Sandstone	B	Mod. 2-5	Mod. Rapid	Stable	Severe	Good	Low	High
Maymen	Loam	12"	Acid	Sandstone	C	1-3	Rapid	Stable	Severe	Good	Low	High

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1/ See page 7 - Type IV River Basin Study (Dos Rios Reservoir Project-California).

2/ Unstable material - areas containing natural landslides, slumps that will become serious when disturbed by road construction, logging or clearing.

Stable material - areas containing material that will not present any problems by road construction.

The sandstones and schists of the Galice and Franciscan formations are moderately stable; however, many slumps and slips may occur when roads are constructed through them, if the bedding planes lie parallel to the canyon wall. Natural slumping and slides in the Franciscan formations are attributed to the extensive broad fault zones found within the formation. These fault zones occur vertically along the steep drainageways and collect water which causes the slumping.

Water Yield and Quality

At the present time, BLM administered lands are contributing approximately 50,600 acre feet of water annually to the reservoir site. Chemically, water quality is very high; however, during periods of heavy runoff, suspended sediment is extremely heavy.

Due to steep topography (many slopes in excess of 60 percent) and highly concentrated runoff, approximately 3,785 tons per square mile of sediment annually are washed into the impoundment area.1/ From the 50 square miles of BLM lands within the watershed, the yield totals 189,250 tons annually. This amount is considered an irreducible minimum. Construction of the project could result in a very substantial increase in sediment yield in the absence of specific preventive measures.

1/ Preliminary Type IV River Basin Study Report on Eel and Mad River Basins, U.S. Dept. of Agriculture, Soil Conservation Service, U.S. Forest Service, and Economic Research Service.

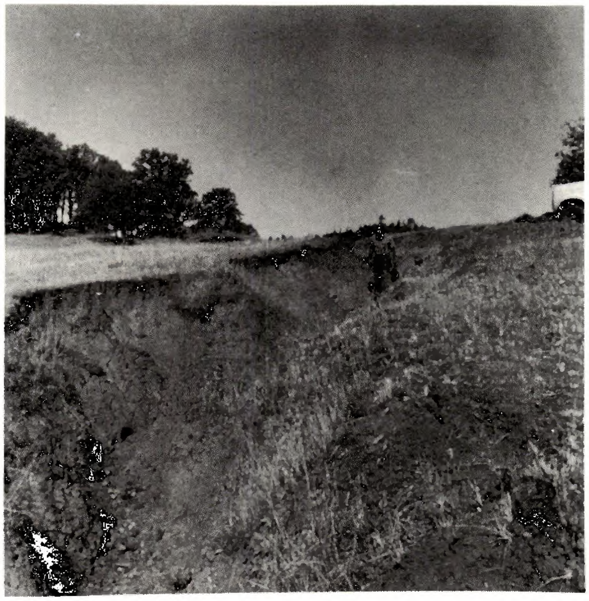
Since many of the soil types are of high clay content and of unstable nature, wave action in the reservoir can be expected to cause toe cutting and resultant small and massive land slips. This, added to the natural erosive process, can add to the sediment yield and can be expected to create seasonal turbidity problems.

Based on the data collected and field observations, the following recommendations for watershed protection are made.

Road Construction

The following precautions should be taken in all road construction:

1. Avoid building roads and trails across a slide either active or static. If it is necessary to locate the road across a slide, road construction must be carefully planned. Roads located here can be expected to have high initial costs, excessive operation and maintenance costs, road failures, increased erosion and sedimentation and lost land and aesthetic values.
2. Sacrifice alignment in favor of reduced excavation and soil disturbance.
3. Stay on ridge tops and benches, where possible.
4. Construct roads during the dry season.
5. Avoid excessively large cuts and fills and waste accumulations near channels.



Typical gully erosion in the area. This site is on the west side of Elk Creek along the Eden Creek road. These are the Yorkville soils, which comprise approximately 10% of the project lands. This gully is man caused, as a result of improper road drainage. The picture below shows additional gully erosion that has started from the Eden Creek road.

6. Avoid channel relocation, whenever possible. When necessary, relocate channels in solid rock bottom areas.
7. Seed and mulch cut and fill areas.
8. Provide adequate culverts and drop structures.

Grazing

1. Grazing should be restricted on "creep mantle" areas and active landslides.
2. Allow only carefully controlled grazing on old static landslides.
3. After construction of the reservoir, permit grazing only if interim grazing has shown no significant adverse effects on the watershed.

Recreation

1. Consider rip-rapping or rock cribs around boat launching areas where wave action can cause turbidity and bank slipping.
2. Consider surfacing heavy use areas in recreation sites, and seeding and fertilizing surrounding disturbed areas.

Forestry

1. Prohibit logging activities or equipment use in or along water courses or water impoundment areas.
2. Drain, seed and fertilize all skid trails and temporary roads.
3. Use high lead, skyline or balloon logging in critical areas instead of tractors.
4. Restrict winter logging.

Wildfire

1. Construct fuel breaks to reduce area size of high fire hazard areas and to provide access for control.
2. Rehabilitate wildfire areas.
3. Reduce fuel concentrations in critical fire hazard areas.

Watershed Plans

Approval for construction of the project would necessitate preparation of watershed management plans for the entire watershed. Because of the soil types and high erosion hazard, substantial cost increases should be incorporated into all phases of recreation, road and trail, and power line construction. Costs of a few of the items identified above are chargeable as project costs and are included in the financial summary section. Subsequent construction costs should be borne by the managing agency.

C. RECREATION

Because of its proximity to the San Francisco Bay Area and the Sacramento Valley population centers and because of its outstanding natural setting and large size, the proposed project should be a major recreation attraction. However, the location and quality of access roads and the amount of reservoir turbidity and draw-down during the recreation season would have an important effect upon its popularity. There would be many opportunities for the development of recreation sites and facilities on the 200 miles of shoreline, including 40 miles presently administered by BLM.

Comments Concerning Corps of Engineers Report of April, 1968, Appendix D - Recreation, Fish and Wildlife

In general, the BLM concurs with the Corps' estimate of recreation visitor days (ultimately 7 million), expenditures for recreation facilities (ultimately $48 million, exclusive of the Indian portion) and other recreation features of the subject appendix. However, in BLM's opinion, the south side of the reservoir, particularly the Elk Creek arm, has outstanding physical features and a potential for public use which should receive more attention than tentatively assigned in the Corps' plan. Also, since the proposed Bureau of Reclamation English Ridge project (see Map 1) is only 5 miles south of the Dos Rios project, recreation plans for the two proposed projects should be coordinated. In particular, the two projects should be joined by a corridor of project land and by a connecting road.

On the south side of the proposed Dos Rios project, BLM has identified nine potential recreation sites of high quality. Six of these sites are in the vicinity of the west side of the Elk Creek arm and three on the south side of the Eel River channel. Two of the above sites, including boat ramps and parking areas should be constructed initially as a project cost. (See Map 4)

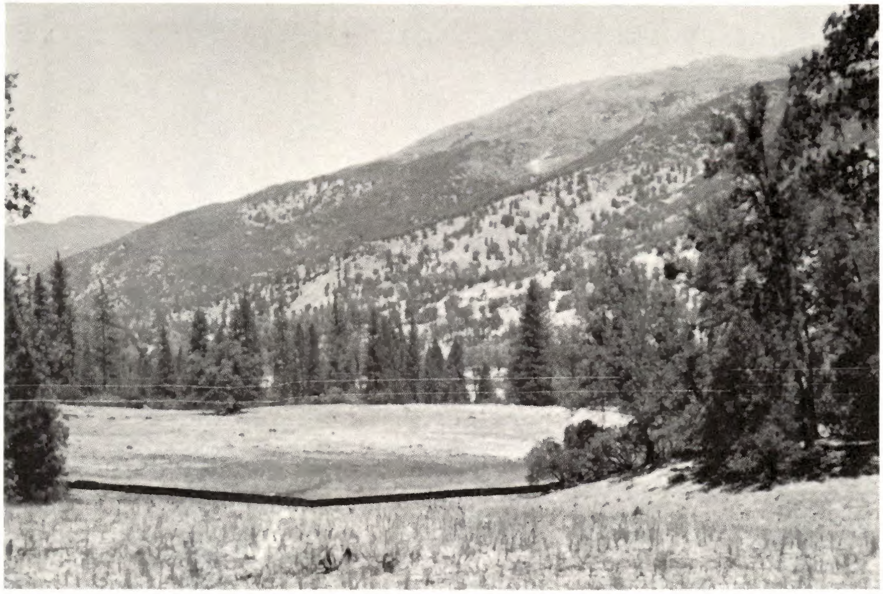
(1) Initial Development (1980)

Approximately 86 acres would be required for development of the two recreation sites proposed for initial development. The following is a breakdown of the land needs for meeting initial facility requirements.

Westslope Recreation Site		Bennett Valley Recreation Site	
Camping	40 acres	Camping	20 acres
Picnicking	20 acres	Boating	2 acres
Boating	4 acres		

(2) Ultimate Development

Facilities to meet optimum recreation use should be provided by the administering agency. As the administering agency, BLM would assume full responsibility for future recreation development. This would include all necessary public facilities



View looking north from the Bennett Valley recreation area recommended for initial construction. Line indicates approximate high pool elevation.

South side of Bennett Valley recommended for recreation expansion. This valley is 150 feet above maximum pool elevation.

Typical vegetation of West Slope recreation site
recommended for initial construction

Views of the Proposed Cypress Flat recreation site

and such concessions as are required for public convenience. Initial facilities would accommodate recreation demands for the first several years. Future demands would be met by additional developments throughout the economic life of the project or until optimum development is attained.

Land and developments required to meet public recreation needs to year 2000 are shown in Table 2. Table 3 presents the estimated costs of recreational facilities at selected points during the repayment period.

The nine potential sites, encompassing a total of about 800 acres, would provide for an estimated 1,500,000 visitor days annually during the 120 day recreation season.

The terrain on the east side of Elk Creek from Thatcher Creek south is precipitous and erodable and does not contain sites suitable for development. BLM proposes that it be managed as a semi-wild area.

Special Considerations

The following should be given special consideration in the planning, design and development of the project.

1. Location and design of roads should be planned to conform to the terrain and to obtain maximum scenic benefits. Cut and fill slopes on roadways should be planted or seeded with vegetation native to the area.

Table 2

Increment of Recreation Facilities Needed Over Twenty Year Period

	Camping		Boating		Picnicking	
Year	Family Units	Acres	Launching Ramps	Acres Parking Included	Family Units	Acres
1980	150	60	2	6	80	20
1990	150	60	1	3	80	20
2000	200	80	2	6	125	35

Table 3

Estimated Costs with Partial Development (1980-2000)

	Initial Development		Future Development - BLM 1/			
	1980		1990		2000	
Facilities	Needs	Costs ($)	Needs	Costs ($)	Needs	Costs ($)
2/ Camp Units	150	450,000	150	450,000	200	600,000
3/ Boat Launching Ramp	2	150,000	1	75,000	2	150,000
4/ Picnic Units	80	216,000	80	216,000	125	337,500

1/ Additional developments needed

2/ Including table, grading, grate, garbage cans and stand, parking space, and pro rata share of secondary circulating roads, sanitary facilities, water system, trails, walks, barriers, signs, etc., @ $3,000.

3/ Concrete - $5,000/100 ft. ramp, 1500 ft. of ramp per lane @ $75,000/lane.

4/ Including tables, grading, garbage cans and stand, parking space, and pro rata share of stoves, circulatory roads, sanitary facilities, water, trails, barriers, signs, etc., @ $2,700.

2. Powerlines should be located so they detract as little as possible from the natural setting.
3. All private land within the proposed project boundary should be acquired. This will assure a buffer between the reservoir and private lands.
4. Quarries, borrow pits and spoil areas should be limited to areas below minimum pool elevation so as to preserve the natural setting. If this is not practicable or feasible, they should be located so as to leave minimum scars on the landscape. Upon completion of the total project, or any portion thereof, all such areas should be landscaped so as to restore the natural appearance.

BLM Views Concerning Management

BLM has no existing recreation facilities within the proposed project area. However, considerable use is made of BLM lands for deer and upland game hunting, fishing and primitive camping. BLM maintains a district office at Ukiah. Recreation is one of the resource management responsibilities of this office. In September 1968, these responsibilities included the administration and maintenance of 28 recreation sites, 20 miles of recreation trails, and 126 miles of BLM roads used by recreationists. Plans are being prepared to develop many other recreational facilities and to modify resource management technique to enhance recreation and wildlife values.

Also, preliminary plans provide for BLM management of the recreation program for the adjacent proposed English Ridge project as a Federal responsibility under Title I of the Federal Water Project Recreation Act (P.L. 89-72).

Since BLM lands in the vicinity of both projects have been classified for retention in Federal ownership and the projects have many similar features, it appears that the best public interest would be served if the recreation features of both projects were operated by the same land management agency. BLM is prepared to assume management responsibility including recreation on the acquired lands in addition to its existing responsibilities. This proposal applies to the entire Dos Rios project, except for the Indian lands, the Covelo townsite, and the National Forest lands.

D. FISH AND WILDLIFE HABITAT AND FACILITIES

Effect on Habitat

The Middle Fork Eel River and its tributaries are extremely important spawning areas for Chinook salmon and steelhead trout. An estimated average of 13,000 fall-run Chinook salmon and 23,000 steelhead trout spawn in about 150 miles of these streams upstream from the Dos Rios damsite. About 12 miles or 15 percent of the steelhead spawning area upstream from the dam are on BLM land. These will be lost because of the project. Virtually all of the 4,980 acres of BLM land that would be flooded is black-tailed deer habitat. This represents about 12 percent of the total 40,000 acres of deer habitat affected by the project. However, because of the cover types, it represents about 25 percent of the value of the deer habitat to be lost, based on deer-days of use. Losses to other species will occur on BLM lands, but no specific data is available. The Bureau of Sport Fisheries and Wildlife report will provide additional information.

Mitigation Features

BLM will not be involved in the fish mitigation features. However, BLM will probably be involved in the wildlife mitigation. BLM lands may offer some limited potential for this work, especially on the east side of the reservoir. The mitigation area has not been selected as of the date of this report.

The Bureau of Sport Fisheries & Wildlife and California Department of Fish and Game will be working on this in conjunction with BLM and the Forest Service.

Enhancement Features

No plans for wildlife enhancement are presently under consideration. BLM would become involved in fishery enhancement only to the extent of installing and managing angler use facilities in areas administered by BLM. Angler use facilities to be included in project costs are specified in the BSF&W report.

Position of State and Federal Agencies Concerning Management

If the mitigation areas are comprised entirely of acquired private land, the California Department of Fish and Game would plan to manage them. If both acquired and Federal lands are involved, they could be managed by either BLM, the U.S. Forest Service, or both, depending on location.

BLM Views Concerning Management

Generally, BLM should manage the public domain and associated acquired lands involved in the wildlife mitigation area. In selecting mitigation areas for acquisition, strong consideration should be given to areas that would block in public lands, and create more practical management areas. One area that should be considered is in the vicinity of Eden Valley. It is near the mitigation area for the English Ridge Project. The two areas could complement each other.

BLM should work very closely with BSF&W and CDF&G in the selection of mitigation areas where BLM might become the managing agency. Such planning should be (1) sufficiently detailed to clearly define the objectives; (2) technically and economically feasible; (3) within the biological capabilities of the habitat and wildlife species; (4) coordinated with other land uses; and (5) compatible with specific BLM policy and program restrictions.

E. LIVESTOCK FORAGE

BLM Lands

The grazing area consists of chaparral with a few islands of grass scattered along the canyon slopes. Grazing values are minimal in comparison with those for recreation, wildlife and watershed.

Present available forage and grazing leases:

Elmer T. Gunnar lease	91 AUMs
Joseph H. Thompson lease	6 AUMs
Forage not leased	1,703 AUMs
Total	1,800 AUMs

Water impoundment will result in an estimated loss of 143 AUMs of forage having a commercial value of $214.50 per year.

Following project construction, grazing use would be controlled by fencing and other range practices to insure preservation of the watershed and to prevent conflicts with incompatible uses.

The Horse Pasture Ridge area of 5,200 acres was burned by wildfire and seeded in the fall of 1966. An allotment management plan for grazing is presently being prepared for this portion of the watershed.

There are no existing improvements on Bureau of Land Management lands that would be inundated by the proposed project.

Lands to be Acquired

Livestock grazing on lands proposed for acquisition should be controlled and leased in conjunction with intermingled and adjacent public domain. This will require a range resource survey and implementation of additional allotment management plans. Cost estimates of measures to improve grazing on acquired lands have not been prepared at this time.

BLM Views Concerning Grazing Management

Livestock grazing can continue to be one of the multiple uses in the proposed project area provided watershed and wildlife values are preserved and segregation from conflicting uses is maintained.

Typical vegetation within the Dos Rios Project Area in foreground with Horse Pasture Ridge in background.

A wildfire burned 5200 acres of BLM land in 1966. The area was rehabilitated immediately afterward with perennial grasses to reduce erosion. Livestock management plans will be formulated in the near future.

F. FORESTRY

BLM Lands

The forested BLM lands affected by the proposed project comprise 8,981 acres on which there are over 84 million board feet of commercial timber. The majority of this timber is Douglas fir with lesser amounts of ponderosa pine, Jeffrey pine and white fir. The timber is located on steep and sometimes highly erodable slopes from 1,300 to 5,800 feet in elevation. All of the timber within the watershed above the proposed project would require special harvesting methods and remedial land treatment practices after cutting to minimize the amount of sediment entering the reservoir. The harvesting methods would include various cable logging techniques, lighter and more frequent selective cuts, and the leaving of buffer zones to protect streams and roads. Intensive land treatment practices would assure immediate replacement of ground cover. These practices would include seeding of the skid trails to grasses, planting logged areas with trees, and water barring skid trails and temporary roads. While these measures are usually included in BLM timber sales, they would be employed within the watershed to an intensity in excess of our normal logging practices. It is estimated that the special timber harvesting and land treatment practices will increase logging costs about $4/M bd. ft. for the harvestable 26 million bd. ft. Because of the aesthetic values of the forests

Because of the esthetic values of the forests and the highly erodable and steep terrain on which the timber grows, approximately 534 acres containing 2 million bd. ft. should not be harvested from the area within the proposed project boundary. If harvested, it could be detrimental to the watershed and recreation programs which are considered to be of higher value.

When constructed, the reservoir would inundate 85 acres of BLM land supporting 220 M bd. ft. of commercial timber. The loss of future timber growth from the 534 acres to be preserved and the 85 acres to be inundated would amount to 194 M bd. ft. annually.

A further loss in timber receipts would be incurred by the increased log haul distances created from inundating the existing Round Valley Road. All the 26 million bd. ft. of timber within the watershed and an additional 56 million bd. ft. which is outside of the watershed would be transported over the proposed project roads south to Highway 101. It is estimated that the increased log haul distance around the proposed project would cost $3.13/M bd. ft. or $256,660 for the 82 million bd. ft. of BLM timber.

The 220 M bd. ft. of timber to be inundated should be sold by BLM. Prior notice must be given by the constructing agency so that the appraisal of the timber can be completed in advance of site clearing.

The following table summarizes the BLM timber lands affected by the proposed project:

	Acres	Volume
Inundated	85	220 M
Within proposed take line (to be logged)	534	2,000 M
(to be preserved)	534	2,000 M
Within watershed and outside take line	4,111	24,000 M
Outside watershed (but affected by increased log hauling costs)	3,717	56,000 M
Totals	8,981	84,220 M

Lands to be Acquired

The acquired timber lands within the proposed project boundary should be administered in conjunction with the intermingled and adjacent public domain. Presently, no estimate of standing timber is available on which to project additional management responsibilities. However, to assure watershed protection and scenic qualities so vital to a popular recreation complex, all timber within the project boundary above 1605 foot contour should be purchased as standing timber. These timber lands could then be integrated into the BLM multiple use management program and become an asset to the project.

BLM Views Concerning Timber Management

Timber management should continue to be one of the major multiple uses in the proposed project area. However, watershed and aesthetic values, because of their critical importance to the proposed project, would determine the objectives and limitations of our timber management plans.

G. MINING CLAIMS AND MINERALS

A mineral investigation was made by BLM for public domain and private lands within the proposed project. The following information is a summary of the BLM mineral report:

Geology and Mineralization of Lands Involved

Mendoci~o County lies within the Northern Coast Ranges and Geomorphic Province. It is largely underlain by rocks of the Franciscan formation. In places, thick sections of Cretaceous and Tertiary sediments are preserved as downfaulted remnants indicating that these younger rocks were formerly widespread but have been largely removed by erosion. The Temblor formation of the middle Miocene age carries a few beds of sub-bituminous coal in its lower members.

The Franciscan formation is predominately a massive brownish to greenish grey sandstone with minor amounts of carbonaceous shale. The sandstone contains periodic lenses of radiolarian chert which are of economic significance because of the manganese deposits sometimes found in them. In places, the Franciscan formation is intruded by sills and dikes of peridotite largely altered to serpentine. This is the rock in which the chromite deposits of the Coast Ranges occur.

The Franciscan formation is predominant in the project area. There are, however, several areas underlain by Tertiary and Cretaceous rocks while Round Valley, a downfaulted block is covered by recent alluvium. The middle Miocene, Temblor, coal-bearing formation is one of the Tertiary deposits found in the area. A copper prospect, several areas of manganese mineralization, but no chromite deposits occur within the proposed project boundary.

Mineral Development Work and Improvements

Deposits of sub-bituminous coal have been found on private land in Sections 2, 11, 13, 24, and 25 of T.21N., R.13W., M.D.M. Their remoteness from markets and the competition of other energy sources have discouraged their development.

A number of manganese deposits in the area were mined during World War I. The deposits are small and none are presently being worked. Some of the deposits are on private lands not subject to mineral location.

There is a copper prospect in Section 13, of T.20N., R.12W., M.D.M. It consists of three quartz stringers carrying copper sulphides and carbonates and has seen no activity since prior to 1914.

BLM's mineral report showed 16 mining claims of record in the area. Proofs of labor have been filed in the Mendocino County Courthouse on nine of the 16 claims as of August 15, 1968. Validity determination would be necessary on all of the claims.

At BLM's request, a mineral investigation was made by the U.S. Geological Survey's Branch of Mineral Classification. The USGS report stated that although some of the lands were "valuable for oil, gas and coal that the use of the surface would not interfere unreasonably with operations under the mineral leasing laws." Their report also stated that none of the lands within the proposed project are considered valuable for geothermal resource development.

Field examination by BLM showed that no valuable deposits of saleable minerals are located in the proposed project. The only saleable mineral to be inundated by the proposed reservoir will be sand and gravel. However, due to remoteness of the deposits and their inferior grade, they are not considered to represent any appreciable value. No revenue will be lost from saleable or leasable minerals in the proposed project area.

Estimate of Reimbursable Charges to Clear Mining Claims

The mining engineer's report states that "four mineral reports will be required. It is assumed that four hearings will be necessary involving eight of the claims". Table 4 lists the mining claims found in the proposed project area.

Estimate of costs:

a.	Salaries of mining engineer, solicitor and hearing examiner	$ 7,320
b.	Other expenses	2,905
	Total reimbursable charges	$10,225

Table 4

MINING CLAIMS

WITHIN THE DOS RIOS PROJECT AREA

Name of Claim or Mine	Mineral	References	Location			Recorded		
			T.	R.	Sec	Book	Page	Year
Deep Hole *	Cu.	C.D.M. Bulletin 144, pg. 271; Vol. 49, pg. 380	20N.	12W.	13			Prior to 1914
Eden Valley *	Cu	C.D.M. R14, pg. 418	20N.	12W.	13			
Little Doe	Mn		22N.	12W.	24	347	392	1953
Lone Fir No. 1	Mn		22N.	12W.	24	347	390	1953
Lone Fir No. 2	Mn		22N.	12W.	24	347	391	1953
Bear Head	Mn	C.D.M. Bulletin 144 C.D.M. Vol. 49	22N.	12W.	24			
Windy Point No. 1	Mn		22N.	12W.	23	506	257	1959
Windy Point No. 2	Mn		22N.	12W.	23	506	258	1959
Little Len *	Mn		22N.	11W.	19			
Big Bend No. 1 *	Mn	C.D.M. Vol. 49, pg. 384 C.D.M. Bulletin 152, pg.113	23N.	11W.	28			Prior to 1917
Big Bend No. 2 *	Mn		23N.	11W.	28			
New Year * #	Mn		23N.	11W.	31			Prior to 1917
Old Country * #	Mn		23N.	11W.	31			
Bar Z No. 5	Mn	C.D.M. Vol. 49, pg. 384 C.D.M. Bulletin 152, pg.113	23N.	12W.	36			
Bar Z No. 6	Mn		23N.	12W.	36			
Bar Z No. 7	Mn		23N.	12W.	36			

* No "Proofs of Labor" being filed.
# On private land whose minerals are reserved to U.S.

Table 5

Mineral Deposits on Patented Lands to which the United States has no Interest

Name of Mine or Owner	Mineral	Reference	T.	R.	Sec.
Camp Carbon	Coal	C.D.M. Vol. 49, pg.357,358&379	21 N.	13 W.	13,24,25
Eel River	Coal	C.D.M. Vol. 49, pg. 358 & 379	21 N.	13 W.	2
Mt. Vernon	Coal	C.D.M. Vol. 49 pg. 379	21 N.	13 W.	11
Morrison Prospect	Mn	C.D.M. Vol. 49 pg. 389	22 N.	12 W.	1
Nowlin Mine	Mn	C.D.M. Vol. 49 pg. 389	22 N.	13 W.	3
Breton Mine	Mn	C.D.M. Vol. 49 pg. 384	23 N.	11 W.	30
Rhodes and Hurt Prospect	Mn	C.D.M. Vol. 49 pg. 389	23 N.	13 W.	36

The above mineral estates will have to be purchased from the owners. The value of these deposits is believed to be small; however, their owners will be entitled to just compensation.

H. ROADS

An extensive road system would be required to replace the road inundated by the project to provide for management of resources around the reservoir and to provide access for the public to the recreational features of the project.

The Corps of Engineers has proposed certain roads as project features.

1. The Westside Road around the west and north sides of the reservoir to replace the inundated Covelo Road.
2. A road from the Westside Road onto the large peninsula southeast of the main body of the reservoir.
3. A road and bridge from the Westside Road onto Dingman Ridge (which would be an island).
4. An extension of the Westside Road around the east side of the reservoir to the works at the entrance of the proposed Dos Rios-Grindstone Tunnel.

The above proposals do not provide adequately for management of public lands around the reservoir, especially considering the greatly increased use the project would generate. The following additional and revised proposals are a result of this study. Map 1 and 4 show BLM's proposed roads.

1. Big Butte Road (BLM #501) provides access to the public domain lands north of the project area. While the road is presently

owned by Crawford Lumber Co., negotiations are in progress for BLM to purchase this road in FY 1970. Approximately two miles of this road would be inundated. The proposed Westside Road would cross the Big Butte Road at a new location and a new approach would have to be built. The estimated cost of the new approach would be $8,000.

2. A road is proposed from the dam to the Elk Creek area at Bennett Valley. The proposed project would inundate the present Elk Creek Road, which is a private road providing BLM administrative access to public domain west of Elk Creek. After construction of the project, access to both BLM and acquired lands in this area would be essential due to anticipated heavy public use for recreation, for fire protection, and for management of all the resources. This Bennett Valley Road would cross the dam and parallel the reservoir to the Bennett Valley recreation site on the west side of Elk Creek. It should be a two land road because of the heavy recreation use.

3. From Bennett Valley, a single lane road should be built around the Elk Creek arm to the vicinity of Thatcher Butte. This Elk Creek Road is a vital link in the fire protection program, and would also be used for light recreation traffic and general administration. Near Thatcher Butte the Elk Creek Road would connect with the existing, low standard Horse Pasture Road.

At present, the Horse Pasture Road extends about 5 miles northwesterly from Thatcher Butte. From here, it should be extended to the north and connected with the tunnel road proposed by the Corps of Engineers. The Horse Pasture Road would be of the same standards and serve the same purposes as the Elk Creek Road, and would eliminate two dead-end roads.

4. A road would be needed to connect the Dos Rios project to the English Ridge project, assuming both are built. This Eden Valley Road should be two lane, and it should run from the Bennett Valley Road west of Elk Creek, southwest to the English Ridge Road system. This road would be highly desirable for fire protection and administrative purposes and should be heavily used by recreationists.

5. The present Corps of Engineer's proposal is to relocate the main road west and north of the reservoir. The existing road is designated State Route 261, and it is planned for this to become an important link between Highway 101 and Interstate 5 in the Sacramento Valley.

   An alternate to this would be to connect the proposed peninsula road and the Dingman Ridge Road by way of a bridge across Mill Creek. This route has the advantage of being about 12.5 miles shorter than the Westside Road. It will eliminate two dead-end roads and greatly facilitate administration. Through traffic would be speeded up. Comparing the existing Covelo Road and the proposed Westside Road, the log hauling costs for BLM timber would be $256,660 more with the project. The BLM proposal would be $155,800 more with the project, a saving of $100,860. These figures apply to 82 million bd. ft. of timber both within and outside the watershed. Similar savings would accrue to a much larger volume of Forest Service and private timber which would also pass over this road.

Time and facilities available did not allow a comparison to be made of the construction and maintenance costs of these alternatives. This should be a subject for further study.

6. The Bland's Cove Road, which is a Forest Service road, provides access to the Hams Pass tract of BLM land northeast of the project. This road approach would be inundated. The cost of constructing a new approach will be included in the Forest Service Impact Study.

Our preliminary estimates of construction costs for these proposals are as follow:

Road	Width	Length	Cost
BIG BUTTE approach	20' subgrade	600'	$ 8,000
UPPER ELK	16' subgrade	14½ mi.	
Survey & Design 14½mi. x $1600			23,200

UPPER ELK (CONT.)	Width	Length	Cost
Grading $14^{\underline{5}}$ mi. x \$15,000/mi.			\$217,500
Surfacing $14^{\underline{5}}$mi. x \$22,000/mi.			319,000
Const. Engineering 15% of (\$217,500 + \$319,000) =			80,500
		TOTAL	\$640,200
Cost/mi. = $\frac{\$640,200}{14^{\underline{5}}} \equiv \$44,200$/mi.			
HORSEPASTURE ROAD	16' subgrade	9 mi.	
Survey & Design 9 mi. @ \$1600			\$ 14,400
Grading 9 mi. @ \$15,000			135,000
Surfacing 9 mi. @ \$22,400/mi.			201,600
Const. Engineering 15% of (\$201,600 + \$135,000) =			50,500
		TOTAL	\$401,500
Cost/mi. = $\frac{\$401,500}{9} = \$44,600$/mi.			
OUTLET SEGMENT	28' subgrade	3 mi.	
Secondary State Hwy. Standard			
3 miles (S & D, Grade, Surface with concrete asphalt surface) \$700,000/mi. x 3			\$2,100,000
Bridge 1500' min. length x 28' wide 42,000 sq. ft. x \$30/sq. ft. =			1,260,000
		TOTAL	\$3,360,000
Cost/mi. = $\frac{\$3,360,000}{3} = \$1,120,000$			

	Width	Length	Cost
BENNETT VALLEY ROAD	24' subgrade	21 mi.	
Land Acquisition (70 acres at $250)			$ 17,500
Survey & Design 21 mi. x $2,000			42,000
Grading			
1st 2 miles @ $30,000			60,000
19 miles @ $20,000			380,000
Surfacing $22,000 x 21 mi.			462,000
Const. Engineering 15% x ($440,000 + $462,000) =			135,300
	TOTAL		$1,096,800

$$\text{Cost/mi.} = \frac{\$1,096,800}{21} = \$52,200/\text{mi.}$$

EDEN VALLEY ROAD	24' subgrade	10 mi.	
Road Improvement to bring to Sn24 standard			
Land Acquisition (155 acres at $250)			$ 38,800
Survey & Design 10 mi. x $2,000			20,000
Grading 10 mi. x $20,000			200,000
Surfacing $22,000 x 15 mi.			330,000
Const. Engineering 15% of ($200,000 + $330,000)			79,500
	TOTAL		$ 668,300

$$\text{Cost/mi.} = \frac{\$668,300}{10} = \$66,800/\text{mi.}$$

I. CADASTRAL SURVEY AND CORNER MONUMENTATION

The following cadastral survey needs and estimated costs have been determined for the proposed project.

BLM Lands

1. Corners to be inundated controlling public lands (82)
2. Witness corners and witness points required to perpetuate the inundated corners controlling public lands. (130)
3. Miles of section line survey needed to establish the above corners. (120)
4. Total number of miles needed for public lands. (120)
   At approximately 1.5 miles per week = 80 party weeks.
   (100 man months)
5. Total cost for public lands. 80 party weeks at approximately $1875.00 per week = $150,000.

Lands to be Acquired (Private)

1. Corners to be inundated controlling private lands to be acquired. (140)
2. Witness corners and witness points required to perpetuate the inundated corners controlling private lands. (50)
3. Miles of section line survey needed to establish the above corners. (70)
4. Miles of proposed take line needed. (110)
5. Miles of subdivision of sections and section boundaries necessary to establish the take line. (290)

6. Estimated number of miles of retracement needed to reestablish missing corners that control take line. (350)
7. Total number of miles needed for private lands (720) at approximately 1.5 miles per week = 480 party weeks. (600 man months)
8. Total cost for private lands. 480 party weeks at approximately $1875.00 per week = $900,000.
9. Total cost for survey of both private and public lands acquired and establishment of take line = $1,050,000.

It is recommended the 'take line' be surveyed first, as this will provide the necessary exterior control for any missing corners of the lands to be acquired.

It has been our experience in this area that dependent resurveys can result in highly distorted conditions due to the procedures taken by the original surveyors. There has been a limited amount of recent surveys made in this area, therefore the conditions are unknown. It is quite possible that extensive retracements will be necessary for the control of missing corners. This could result in a discrepancy between actual and estimated cost of survey.

The irregular boundary line for the proposed project will result in the need for subdivision of section lines creating an additional number of miles surveyed at an increased cost to the project.

Reestablishment of the proposed boundary to follow section lines, where possible, would result in a substantial savings to the cost of the proposed project.

Under the present personnel ceilings, insufficient manpower is available to accomplish the required surveys in the immediate future. Accordingly, a lead time of two to three years is reasonable to program the work.

J. RESOURCE PROTECTION

BLM Lands

The creation of the large reservoir and construction of recreational facilities would attract several million visitors annually and would greatly increase the risk of forest fires, vandalism, littering, pollution, and unauthorized refuse dumping. Much more intensive protection of these lands must be provided. Firebreaks along and occasionally perpendicular to most of the proposed roads are necessary to reduce the risk of fire and expedite fire control operations. On BLM lands this would amount to about 25 miles of fuel break, or 375 acres at an average cost of $50 per acre, or a total of $18,750. Firebreaks are needed in the West Elk Creek area where thick brush, oaks, and cypress prevail. One major fire in this area could destroy all scenic and recreational values. In order to protect visitors, no major road should dead-end. In addition, all roads should be wide enough to accommodate traffic during a fire emergency. At the present time, the California Division of Forestry is under contract with BLM for fire control on all BLM lands in the proposed project area.

Acquired Lands

Fire protection on the acquired lands should be provided by the California State Division of Forestry.

BLM Views Concerning Management

Plans for firebreak layout and development on acquired lands should be accomplished by BLM in conjunction with similar fire prevention work on public domain lands. This arrangement would apply to all project lands except the proposed townsite, the suggested Indian tribal lands, and the National Forest lands. Management of the acquired lands exclusive of the above exceptions should be by the Bureau of Land Management. Protection on the acquired lands would include, but not be restricted to, timber trespass, insect and pest control, fire prevention and pre-suppression, vandalism, littering, pollution and unauthorized refuse dumping.

III. IMPACT OF BLM LANDS AND PROGRAMS ON PROPOSED PROJECT - FINANCIAL SUMMARY

A. Reimbursable

1. Cadastral Survey - BLM Lands	$150,000
" " - Acquired Lands	900,000
2. Mining Claim Examinations	10,225

B. Replaceable Items Chargeable to Project

1. Big Butte Road Approach	8,000
2. Bennett Valley Road	1,096,800

C. Improvements Chargeable to Project [1/]

1. Fuel break construction	18,750
2. Upper Elk Road	640,200
3. Horsepasture Road	401,500
4. Outlet Creek Road [2/]	2,100,000
5. Outlet Creek Bridge [2/]	1,260,000
6. Eden Valley Road	668,300
7. Initial development West Slope and Bennett Valley sites	
a. Camping units - 150 units @ $3,000 unit	450,000
b. Picnic units - 80 units @ $2,700 unit	216,000
c. Boat launching ramps - 2 units @ $75,000/unit	150,000
Total Reimbursable, Replacement and Improvements Chargeable to Project	$8,069,775

[1/] Improvements should be funded by construction agency with contract administration by BLM.

[2/] Alternate road routing to Westside Road

D. Irreplaceable Resources (opportunity costs)

1. Loss of timber production 194 MBF x $30/M = $5,820 Opportunity cost @ 3¼%	$179,000
2. Loss of forage production 143 AUM's x $1.50/year = $215 Opportunity cost @ 3¼%	6,600
3. Loss of wildlife habitat (no dollar value assigned)	
Total Opportunity Cost	$185,600

E. BLM Revenue Loss and Responsibilities

1. Increased logging costs 26 million bd. ft.	104,000
2. Increased hauling costs 82 million bd. ft.	256,660
3. Increased fire protection (to be determined)	
Total	$360,660

CONCLUSIONS AND RECOMMENDATIONS

The more important conclusions and recommendations are set forth below. Specific recommendations of measures required to implement these general proposals, and the facts and conclusions which led to the recommendations, are given in the body of the report.

1. BLM is the major land and resource management agency within the project area. BLM can be authorized, under applicable laws and regulations, to manage the resources on acquired lands, through agreement with the Corps of Engineers. BLM has been recommended to manage the resources on the nearby English Ridge project. Neither the county nor the state has indicated it wishes to be the managing agency for the recreation features of Dos Rios project. Therefore, it is recommended that administration of all the resources, including recreation and wildlife mitigation on the public domain and acquired lands be vested in BLM, excepting Indian lands, the Covelo townsite, lands specifically needed and used for project purposes, and National Forest lands.

2. The minimum facilities required to satisfy recreation needs are described in the body of this report. A road system sufficient for management and protection needs, and to transport recreationists is also described in this report. Certain other costs, income losses, and resource losses are considered to be a direct result of the impact of the project.

It is recommended that the costs shown in the financial summary section of this report be charged to the project.

3. The Eel River is among the highest sediment producing streams in the United States. Great care would be required in managing the resources to prevent excessive erosion from damaging the recreation potential, and possibly shortening the life of the project. It is recommended that watershed management be given increased attention, and that the specific recommendations made in the body of this report be carefully evaluated and acted upon, where appropriate.
4. The Corps of Engineers has proposed to replace the existing Covelo Road with a road around the west and north sides of the proposed reservoir. This report outlines an alternate route via Dingman Ridge and a bridge over the Mill Creek arm. It is recommended that the benefits and costs of the two proposals be carefully weighed and compared before a decision is reached as to which route to follow.
5. It is recommended that as soon as funds for the project are authorized, a working agreement be consummated between the Corps and BLM to cover such items as (1) fire protection of the area during the construction period, (2) supervision of clearing operations, road construction, powerline relocations so as to protect aesthetic values, retain scenic corridors, and provide for the healing and rehabilitation of scars on the landscape, (3) provision for access over project acquired

lands for BLM roads and access to BLM timber, (4) provision for adequate notice to BLM for removal of timber from BLM lands in the project area, and (5) planning and construction of replacement roads.

6. Aesthetic considerations are very important because of the anticipated heavy recreation use on and around the proposed reservoir. It is recommended that borrow areas, spoil areas and other disturbing operations be limited to elevations below the minimum pool level to the extent practicable, and that unavoidable disturbance above this level be restored as nearly as possible to its natural appearance.

7. Wildlife mitigation would be a feature of the proposed project. It is recommended that wildlife mitigation in connection with Dos Rios be coordinated with the mitigation features of the English Ridge project in order to allow logical and efficient management of the wildlife resource.

APPENDIX

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

TABULATION OF BLM LANDS WITHIN PROPOSED PROJECT BOUNDARY

Legal Description		Public Domain Acres	Comments
T. 20 N., R. 11 W.			
Sec. 1:	Lot 2	22.01	
	" 3	22.37	
	" 4	22.74	
	E½ Lot 5	40.00	
	E½ " 6	40.00	
	E½ " 7	40.00	
Sec. 2:	Lot 1	22.95	
	" 2	23.01	
	" 3	23.07	
	" 4	23.13	
	" 5	80.00	
	" 8	80.00	
	W½SW¼	80.00	
	SE¼SW¼	40.00	
Sec. 3:	Lot 1	23.19	
	" 2	23.25	
	" 3	23.31	
	" 4	23.37	
	" 5	80.00	
	" 6	80.00	
	" 7	80.00	
	" 8	80.00	
	S½	320.00	
Sec. 4:	Lot 1	23.37	
	" 2	23.30	
	" 3	23.24	
	" 4	23.17	
	" 5	80.00	
	" 6	80.00	
	" 7	80.00	
	" 8	80.00	
	S½	320.00	
Sec. 5:	Lot 1	23.20	
	" 2	23.33	
	" 3	23.45	

Legal Description		Public Domain Acres	Comments
T. 20 N., R. 11 W. (continued)			
Sec. 5:	Lot 6	80.00)	Wdn. by Ex. Order, 4/3/24; PSC No. 63 under Act 6/10/20, Sec. 24.
	" 7	80.00)	
	NE¼SE¼	40.00	
Sec. 6:	Lot 1	23.64	
	" 2	23.64	Wdn. Ex. Order; PSC No. 14 under Act 6/10/20, Sec. 24.
	" 3	23.64	
	" 4	26.12	
	" 5	43.33	
	" 6	42.23	
	" 7	41.18	
	" 8	40.03	
	" 9	40.00	
	W½ Lot10	40.00	
	" 11	80.00	Wdn. Ex. Order; PSC No. 14 under Act 6/10/20, Sec. 24.
	" 12	40.00	
	E½SW¼	80.00	
	SE¼	160.00	
Sec. 7:	Lot 1	39.48	
	" 2	39.50	
	" 3	39.50	
	" 4	39.52	
	E½W½	160.00	
	E½	320.00	
Sec. 8:	W½NW¼	80.00	
	SE¼NW¼	40.00	
	NW¼SW¼	40.00	
Sec. 9:	N½NE¼	80.00	
	SE¼NE¼	40.00	
	SW¼NE¼	40.00	Wdn. 12/13/30; PSC No. 14, Act of 12/8/21.
	SE¼	160.00	" " " " " " "
Sec. 10:	ALL	640.00	

Legal Description	Public Domain Acres	Comments
T. 20 N., R. 11 W. (continued)		
Sec. 11: W½NE¼	80.00	
NW¼	160.00	
S½	320.00	
Sec. 12: W½NE¼	80.00	
E½NW¼	80.00	
Sec. 14: ALL	640.00	
Sec. 15: ALL	640.00	
Sec. 17: NE¼	160.00	
W½NW¼	80.00	
SE¼NW¼	40.00	
S½	320.00	
Sec. 18: NE¼	160.00	
NE¼NW¼	40.00	
Lot 1	39.30	
" 2	38.67	Wdn. 2/25/14; By FS per "L"
" 3	38.43	" " " " " "
" 4	38.00	
SE¼SW¼	40.00	
S½SE¼	80.00	
T. 20 N., R. 12 W.		
Sec. 1: Lot 1	40.37	
S½NE¼	80.00	
Sec. 12: E½	320.00	
E½W½	160.00	
Sec. 13: N½NE¼	80.00	
SE¼NE¼	40.00	
NE¼SW¼	40.00	
NE¼SE¼	40.00	
S½SE¼	80.00	

Legal Description		Public Domain Acres	Comments
T. 21 N., R. 11 W.			
Sec. 4:	Lot 3	39.52	
	" 4	39.31	
	S½NW¼	80.00	
	SE¼	160.00	
Sec.. 5:	Lot 2	38.90	
	" 3	38.70	
	" 4	38.50	
	S½NW¼	80.00	
	W½SW¼	80.00	
	SE¼SW¼	40.00	
	SW¼SE¼	40.00	
	E½SE¼	80.00	
Sec. 6:	Lot 1	38.60	
	" 2	39.01	
	" 4	38.03	
	S½NE¼	80.00	
	SE¼	160.00	
Sec. 7:	Lot 1	39.70	
	" 2	39.73	
	" 3	39.77	
	NE¼	160.00	
	E½NW¼	80.00	
	NE¼SW¼	40.00	
	N½NE¼	80.00	
	SE¼SE¼	40.00	
Sec. 8:	ALL	640.00	
Sec. 17:	ALL	640.00	
Sec. 18:	NE¼	160.00	
	N½SE¼	80.00	
	SE¼SE¼	40.00	
Sec. 20:	ALL	640.00	

Legal Description		Public Domain Acres	Comments
T. 21 N., R. 11 W. (continued)			
Sec. 21:	ALL	640.00	
Sec. 28:	ALL	640.00	
Sec. 29:	E½	320.00	
	NW¼	160.00	
	N½SW¼	80.00	
	SE¼SW¼	40.00	
	SE¼	160.00	
Sec. 30:	Lot 3	39.11	
	" 4	48.90	
	SE¼SW¼	40.00	
Sec. 31:	S½NE¼	80.00	
	E½NW¼	80.00	
	Lot 1	38.95	
	" 2	39.25	
	" 3	39.55	
	" 4	39.85	
	E½SW¼	80.00	
	NW¼SE¼	40.00	
Sec. 32:	E½	320.00	
	SW¼NW¼	40.00	
	SW¼SW¼	40.00	
Sec. 33:	N½NE¼	80.00	
	SW¼NE¼	40.00	
	SE¼SW¼	40.00	Wdn. Ex. Order 4/17/26; for Pub. Wat. Res. No. 107 per "F" 7/8/42.
	W½	320.00	
	SE¼	160.00	
T. 21 N., R. 12 W.			
Sec. 1:	Lot 1	40.74	
	SE¼NE¼	40.00	
	SE¼SE¼	40.00	

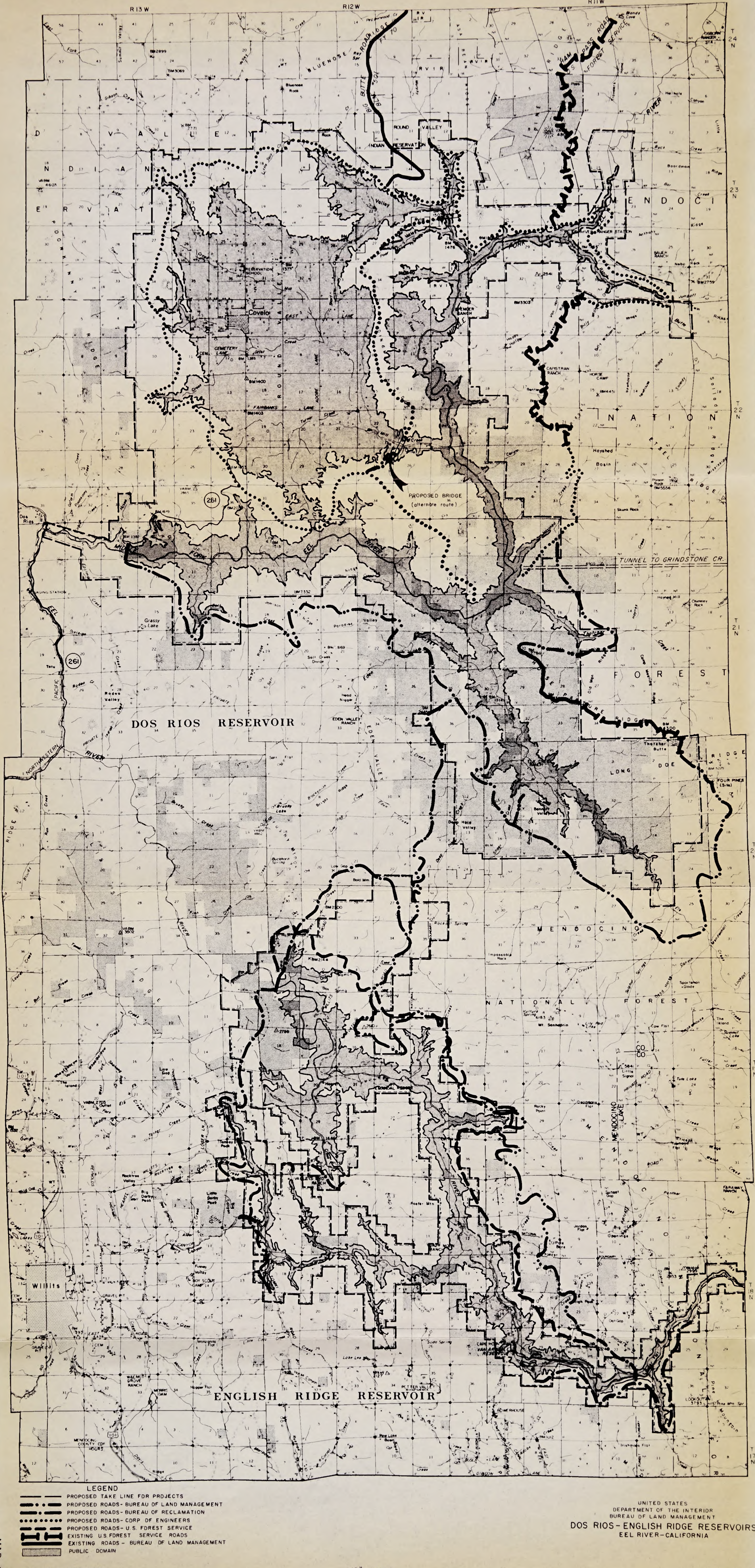
Legal Description	Public Domain Acres	Comments
T. 21 N., R. 12 W. (continued)		
Sec. 3: N½SW¼	80.00	
W½SE¼	80.00	
Sec. 10: NE¼	160.00	
Sec. 11: NW¼NW¼	40.00	
W½SE¼	80.00	
Sec. 12: E½NE¼	80.00	
SW¼NE¼	40.00	
Sec. 13: SW¼NW¼	40.00	
N½SW¼	80.00	
SE¼SW¼	40.00	
W½SE¼	80.00	
SE¼SE¼	40.00	
Sec. 14: E½NE¼	80.00	
S½NW¼	80.00	
SW¼	160.00	
N½SE¼	80.00	
SW¼SE¼	40.00	
Sec. 23: N½	320.00	
Sec. 24: NE¼	160.00	
E½NW¼	80.00	
W½SW¼	80.00	
SE¼SW¼	40.00	
NE¼SE¼	40.00	
Sec. 25: W½E½	160.00	
W½	320.00	
T. 21 N., R. 13 W.		
Sec. 3: Lot 3	40.03	

Legal Description		Public Domain Acres	Comments
T. 21 N., R. 13 W. (continued)			
Sec. 3:	S½NW¼	80.00	
	S½	320.00	
Sec. 4:	S½NE¼	80.00	
	Lot 3	40.22	
	SE¼	160.00	
Sec. 13:	Lot 2	42.80	
	" 3	43.45	
Sec. 14:	Lot 1	42.59	
	" 2	42.91	
	" 6	43.18	
Sec. 23:	Lot 3	39.76	
	" 4	39.75	
T. 22 N., R. 11 W.			
Sec. 18:	Lot 3	40.40	
	" 4	40.35	
	S½SE¼	80.00	
Sec. 19:	N½NE¼	80.00	
	SE¼NE¼	40.00	
	NE¼NW¼	40.00	
	Lot 1	40.21	
	Lot 2	40.00	
	" 4	39.74	
	SE¼SW¼	40.00	
Sec. 30:	E½NW¼	80.00	
	Lot 1	39.55	
	" 2	39.32	
	" 3	39.10	
	" 4	38.87	
	E½SW¼	80.00	
	SE¼	160.00	

Legal Description	Public Domain Acres	Comments
T. 22 N., R. 11 W. (continued)		
Sec. 31: E½	320.00	
Lot 3	38.28	
" 4	38.09	
Sec. 32: SW¼	160.00	
T. 22 N., R. 12 W.		
Sec. 11: Lot 7	9.72	
" 8	22.44	
Sec. 12: S½SW¼	80.00	
SW¼SE¼	40.00	
Sec. 13: NW¼NE¼	40.00	
S½NE¼	80.00	
NW¼	160.00	
N½SW¼	80.00	
SW¼SW¼	40.00	
SE¼SW¼	40.00	Wdn. Ex. Order 10/28/11; PSR No. 217 per "K" 11/6/11 under Act 6/25/10.
N½SE¼	80.00	
SW¼SE¼	40.00	Wdn. Ex. Order 10/28/11; PSR No. 217 per "K" 11/6/11 under Act 6/25/10.
SE¼SE¼	40.00	
Sec. 14: NE¼	160.00	
SE¼SW¼	40.00	
SW¼SE¼	40.00	
NE¼SE¼	40.00	
Sec. 15: NE¼NE¼	40.00	
Sec. 23: NW¼NE¼	40.00	
NE¼NW¼	40.00	
NW¼SW¼	40.00	

Legal Description	Public Domain Acres	Comments
T. 22 N., R. 12 W. (continued)		
Sec. 24: E½NW¼	80.00)	
N½SE¼	80.00)	...Wdn. Ex. Order 10/28/11; PSR No. 217
SE¼SE¼	40.00)	per "K" 11/6/11 under Act 6/25/10.
Sec. 25: E½E½	160.00	
SW¼NE¼	40.00	
E½NW¼	80.00	
NE¼SE¼	40.00	
NW¼SE¼	40.00	
Sec. 31: Lot 8	28.52	
T. 23 N., R. 12 W.		
Sec. 36: Lot 5	33.78	
" 6	41.41	
" 7	42.90	
TOTAL:	23,215.53	

04-080-14



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

DOS RIOS - ENGLISH RIDGE RESERVOIRS
EEL RIVER - CALIFORNIA

MT. DIABLO MERIDIAN

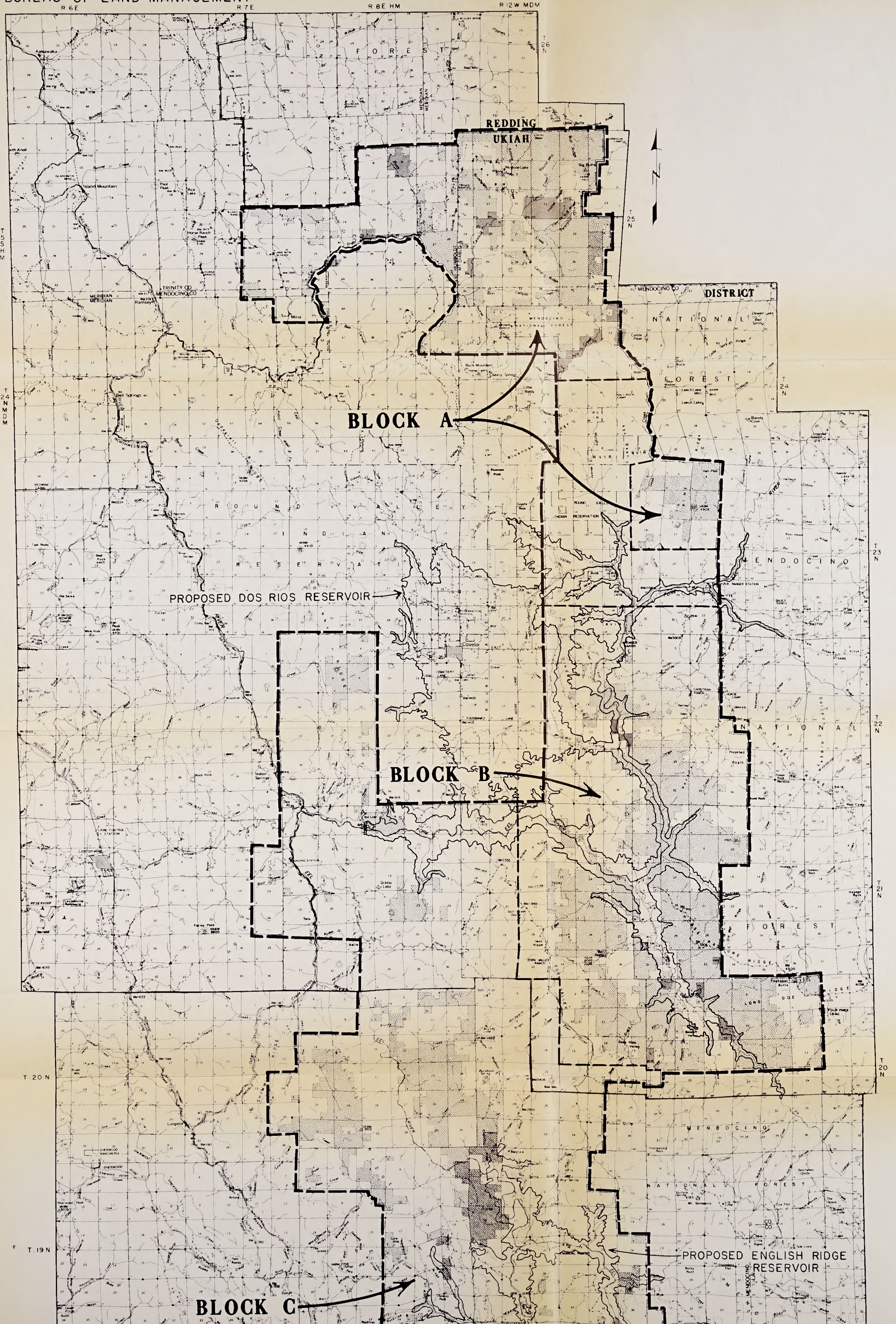
1/2" = 1 MILE

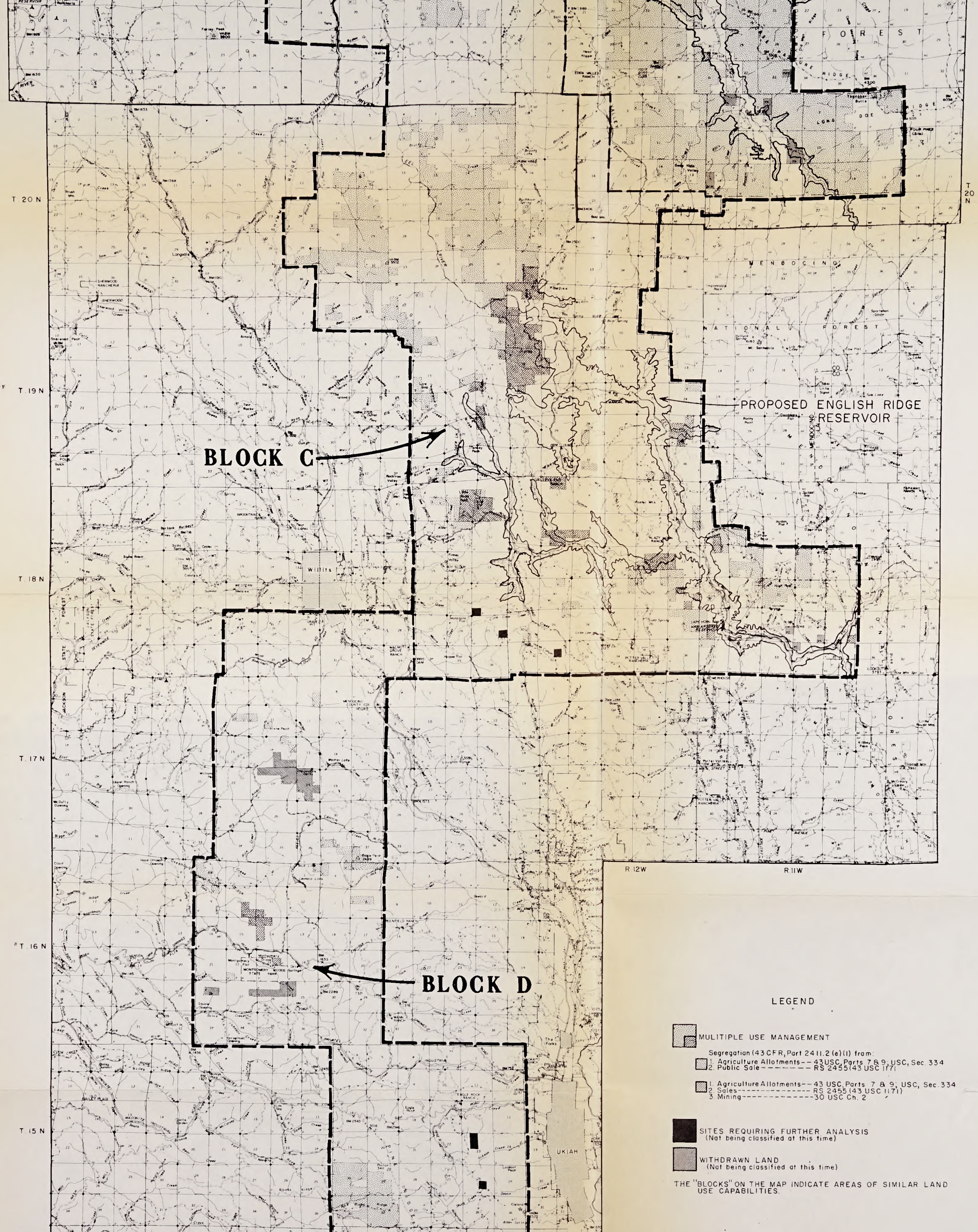
SEPTEMBER 17, 1968

MAP I

BUREAU OF LAND MANAGEMENT CALIFORNIA

AUGUST 22, 1967





LEGEND

▨ MULITIPLE USE MANAGEMENT

Segregation (43 CFR, Part 2411.2 (e)(1) from:

▨ 1. Agriculture Allotments -- 43 USC, Parts 7 & 9, USC, Sec. 334
2. Public Sale -------- RS 2455 (43 USC 1171

▨ 1. Agriculture Allotments -- 43 USC, Parts 7 & 9, USC, Sec. 334
2. Sales -------------- RS 2455 (43 USC 1171)
3. Mining -------------- 30 USC Ch. 2

■ SITES REQUIRING FURTHER ANALYSIS
(Not being classified at this time)

▨ WITHDRAWN LAND
(Not being classified at this time)

THE "BLOCKS" ON THE MAP INDICATE AREAS OF SIMILAR LAND USE CAPABILITIES.

UKIAH DISTRICT OFFICE
168 WASHINGTON AVENUE
UKIAH, CALIFORNIA 95482

DECEMBER 14, 1967

MAP 2

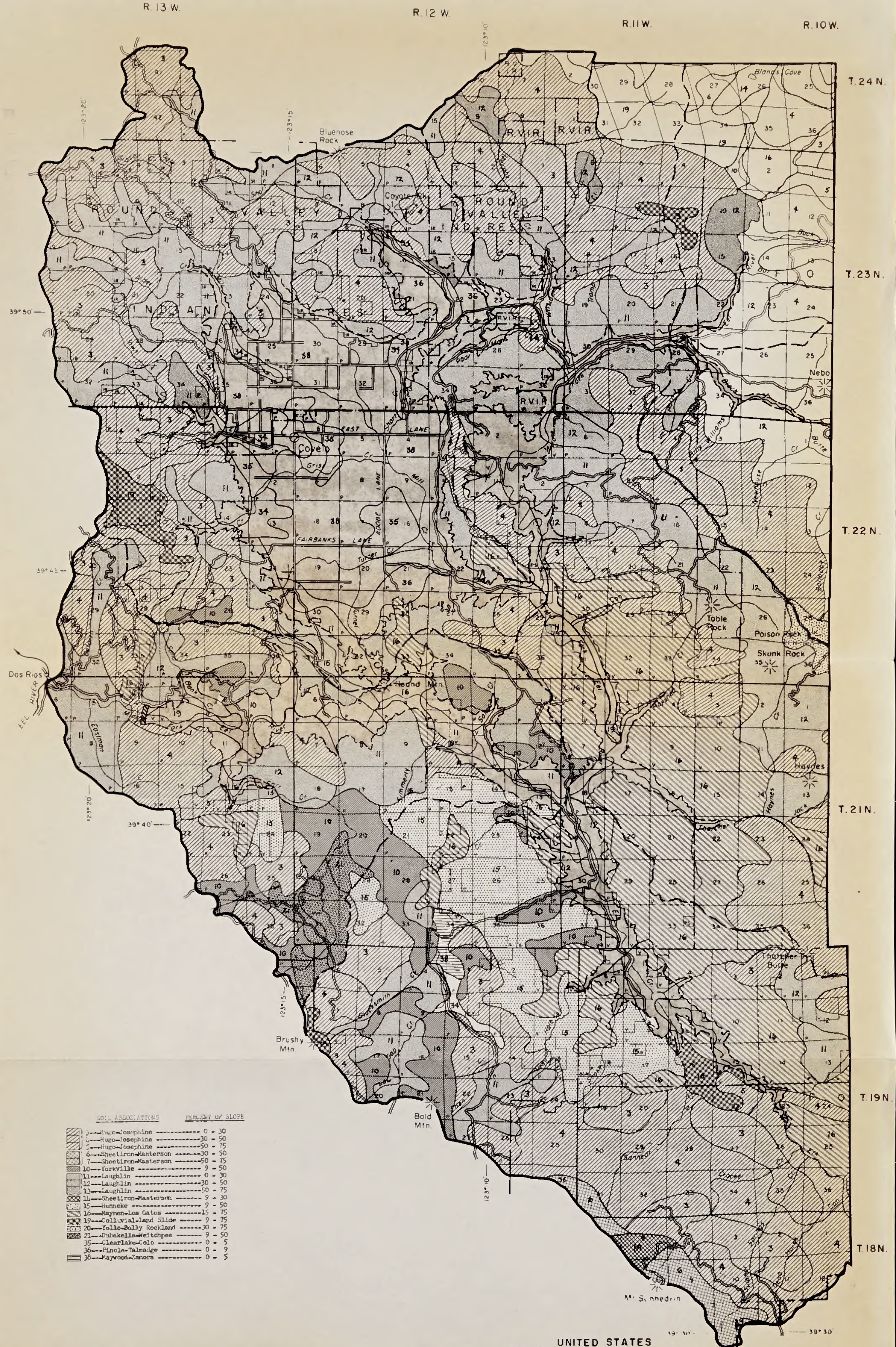
HUMBOLDT AND
MT. DIABLO MERIDIANS

1/2" = 1 MILE

05-33

LAND CLASSIFICATION

EAST MENDOCINO PLANNING UNIT



SOIL ASSOCIATIONS	PERCENT OF SLOPE
▨ 3---Hugo-Josephine	0 - 30
▨ 4---Hugo-Josephine	30 - 50
▨ 5---Hugo-Josephine	50 - 75
▨ 6---Sheetiron-Masterson	30 - 50
▨ 7---Sheetiron-Masterson	50 - 75
▨ 10---Yorkville	9 - 50
▨ 11---Laughlin	0 - 30
▨ 12---Laughlin	30 - 50
▨ 13---Laughlin	50 - 75
▨ 14---Sheetiron-Masterson	9 - 30
▨ 15---Henneke	9 - 50
▨ 16---Maymen-Los Gatos	15 - 75
▨ 19---Colluvial-Land Slide	9 - 75
▨ 20---Yollo-Bolly Rockland	30 - 75
▨ 21---Dubakella-Weitchpee	9 - 50
35---Clearlake-Colo	0 - 5
36---Pinole-Talmadge	0 - 9
▤ 38---Maywood-Zamora	0 - 5

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

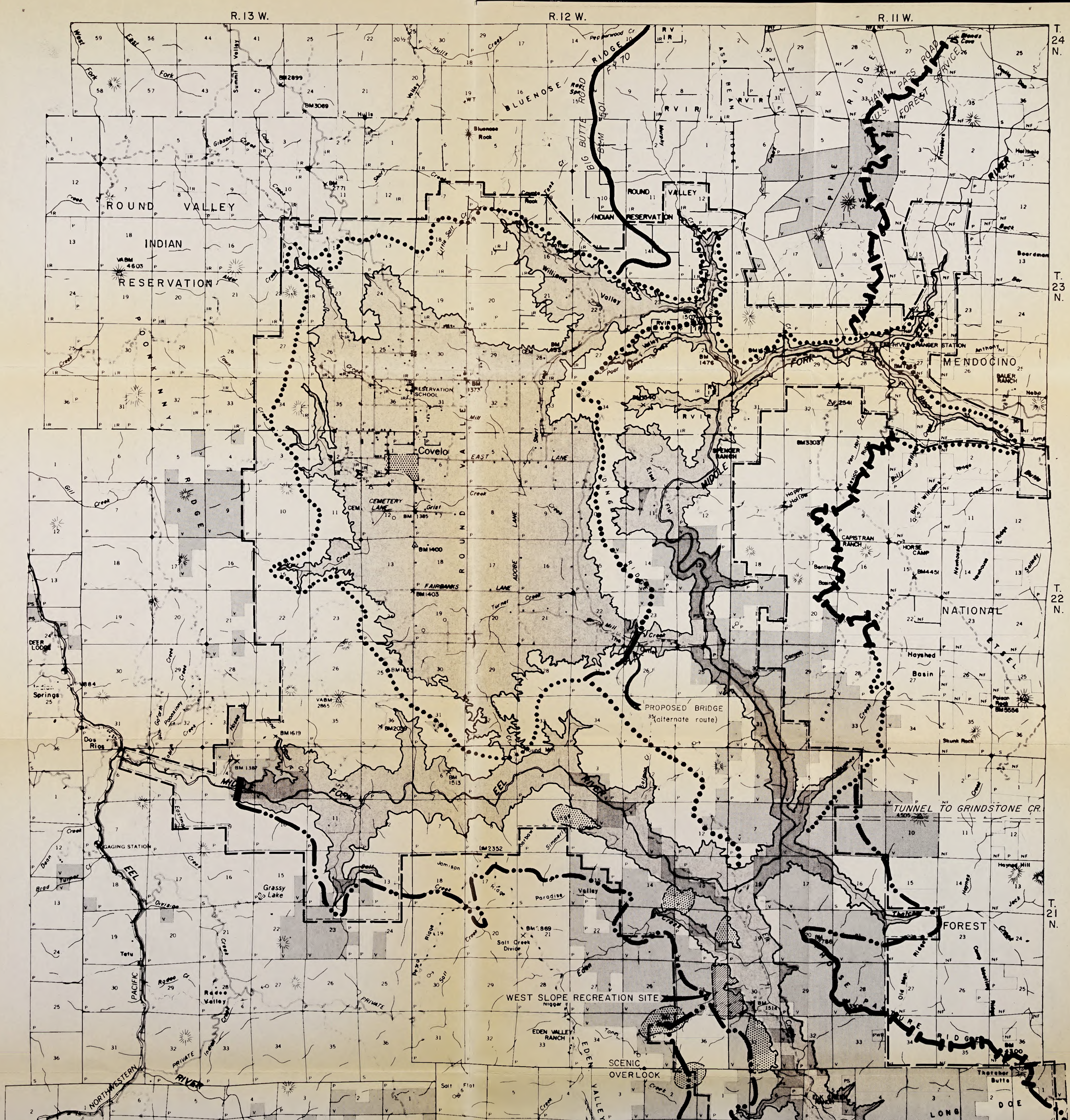
SOILS AND WATERSHED

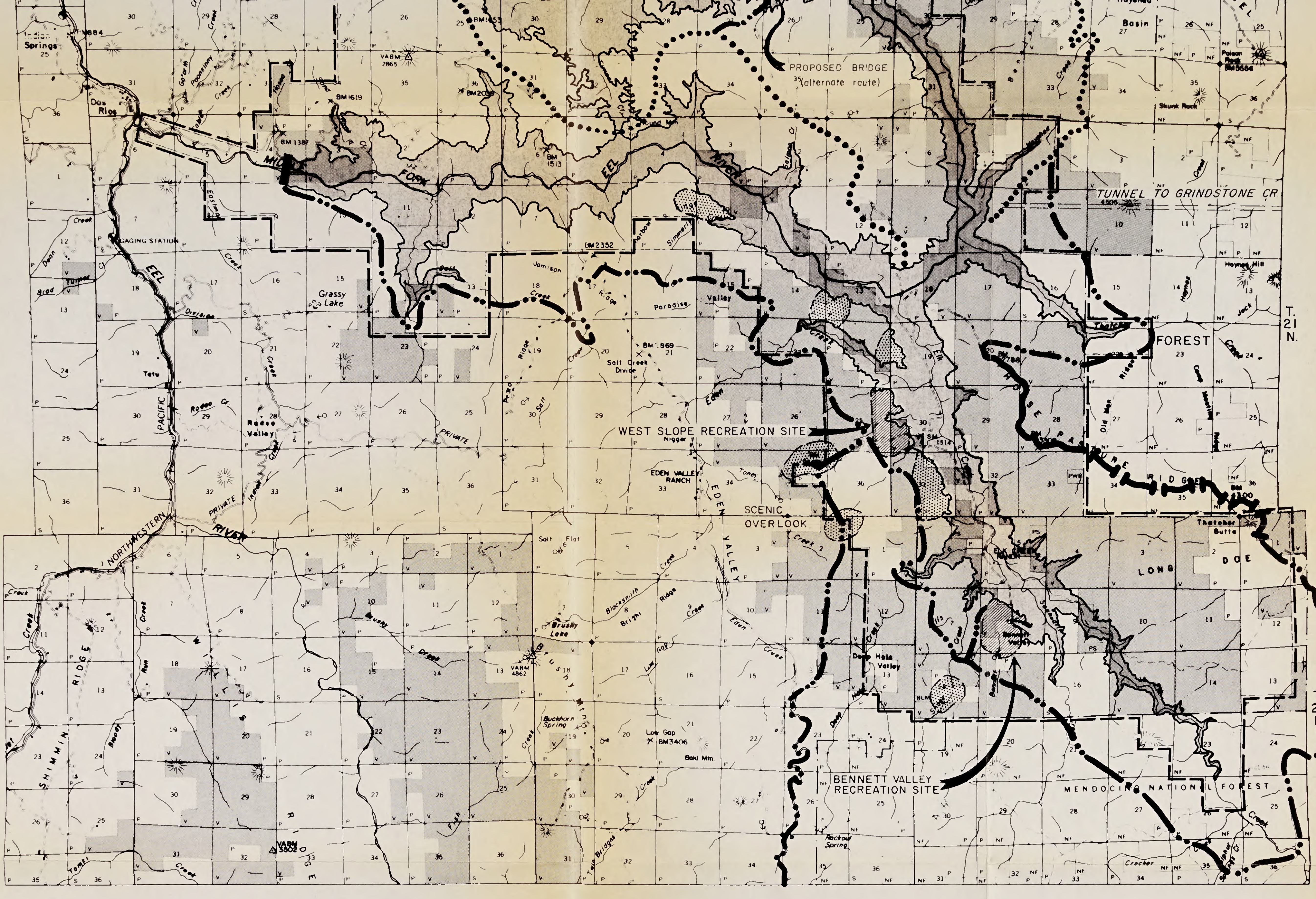
MIDDLE FORK EEL RIVER-CALIFORNIA
DOS RIOS PROJECT

MAP 3

MT. DIABLO MERIDIAN
1/2" = 1 MILE
SEPTEMBER 18, 1968

04-050-10


R.13 W.
R.12 W.
R.11 W.
T. 24 N.
T. 23 N.
T. 22 N.
T. 21 N.
ROUND VALLEY INDIAN RESERVATION
ROUND VALLEY INDIAN RESERVATION
BLUENOSE RIDGE
BIG BUTTE ROAD
PINE RIDGE
HAM PASS ROAD
U.S. FOREST SERVICE
PONKINNY
Covelo
RESERVATION SCHOOL
CEMETERY LANE
ROUND VALLEY
ADOBE LANE
FAIRBANKS LANE
EAST LANE
Williams Valley
Poor Mans Valley
MIDDLE FORK
SPENCER RANCH
RANGER STATION
MENDOCINO NATIONAL FOREST
BAUER RANCH
CAPISTRAN RANCH
HORSE CAMP
Hayshed Basin
Poison Rock
Skunk Rock
PROPOSED BRIDGE (alternate route)
TUNNEL TO GRINDSTONE CR.
MIDDLE FORK EEL RIVER
DEER LODGE
Indian Springs
Dos Rios
GAGING STATION
EEL RIVER
Grassy Lake
Jamison Ridge
Paradise Valley
Salt Creek Divide
WEST SLOPE RECREATION SITE
EDEN VALLEY RANCH
EDEN VALLEY
SCENIC OVERLOOK
Rodeo Valley
PACIFIC NORTHWESTERN
PRIVATE
Salt Flat
ELK CREEK RANCH
Thatcher Butte
HOSE PASTURE RIDGE
LONG
DOE



LEGEND

━━	EXISTING U.S. FOREST SERVICE ROADS
— —	PROPOSED CORP OF ENGINEERS TAKE LINE
• • • •	PROPOSED ROADS – CORP OF ENGINEERS
—•• —	PROPOSED ROADS – BUREAU OF LAND MANAGEMENT
━━━	EXISTING ROADS – BUREAU OF LAND MANAGEMENT
▒	PUBLIC DOMAIN
░	RECREATION SITES – FUTURE POTENTIAL DEVELOPEMENT
▨	RECREATION SITES – BOAT RAMPS, CAMPGROUND AND PARKING AREAS – INITIAL DEVELOPMENT

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

DOS RIOS PROJECT

RECREATION DEVELOPMENT PLAN

MIDDLE FORK EEL RIVER, CALIFORNIA

MAP 4

MT. DIABLO MERIDIAN

1" = 1 MILE

SEPTEMBER 16, 1968